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ENTRIES 1-1326

M. J. Dorsey.

BOTANICAL ABSTRACTS

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FOR EDITORIAL AND BUSINESS NOTICES, SEE THIRD COVER PAGE

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J. R. SCHRAMM, Editor-in-Chief

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Vol. 15 JANUARY, 1926 No. 1

ENTRIES 1–1326

AGRONOMY (CROPS AND SOILS)

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(See also in this issue Entries 175, 305, 321, 322, 401, 420, 447, 448, 512, 516, 528, 545, 546, 568, 585, 652, 744, 746, 747, 959, 960, 980, 1041, 1102, 1107, 1108, 1111, 1126, 1132, 1151, 1152, 1161, 1168, 1169, 1170, 1171, 1177, 1189, 1194, 1220, 1241, 1274, 1275)

CROP SCIENCE (ARVICULTURE)

1. ANONYMOUS. **Agricultural explorations in China.** Lingnaam Agric. Rev. 2^2: 156–158. 1925.—Brief mention is made of explorations in China by the late Frank N. Meyer, C. A. Reed, Joseph F. Rock, and P. H. Dorsett for the U. S. Depart. of Agric.; F. A. McClure for Canton Christian College; F. R. Wulsin for the National Geographic Society; and F. Silvestri for the Univ. of California.—*Albert N. Steward.*

2. ANONYMOUS. **An Australian rotary cultivator.** Australian Sugar Jour. **17**: 105–107. *5 fig.* 1925.—Particulars are given regarding construction, working, cost of operation, possibilities, etc., of a rotary cultivator originally employed in wheat farming, recently introduced into the sugar industry, and said to be well suited to practically all ordinary farm operations. It renders the use of harrows unnecessary, improves aeration of the soil, and effects considerable reduction in cost of cultivation.—*Nellie E. Fealy.*

3. ANONYMOUS. **[An investigation of the cotton industry in the United States.]** (In Chinese translated from the English by S. C. CHEN.) Jour. Ministry Agric. and Commerce Republic of China 11^4: 20. 1924.—The article shows in considerable detail the production, distribution, and annual consumption of cotton in the U. S. A.; and also tells of the governmental interest in the cotton industry.—*C. Y. Chiao.*

4. ANONYMOUS. **Cotton.** Missouri Bot. Gard. Bull. **9**: 119–124. 1921.—A compilation of historical and general material.—*O. F. Cook.*

5. ANONYMOUS. **Flax cultivation. Australia's opportunity.** Jour. Dept. Agric. Western Australia 2nd Ser. **2**: 91. 1925.—Attention is called to the high prices paid for flax fiber and

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to the high quality of the product that probably can be grown, as evidenced by that produced on a small plot at Eden, New South Wales.—*P. J. Olson.*

6. Anonymous. **Hop growing. Report on experiments for the years 1922–1923–1924.** Jour. Dept. Agric. Union of South Africa 9: 326–331. *1 fig.* 1924.—A discussion of a series of hop-growing experiments carried out in the George district of the Cape Colony since 1902. Propagation has been effected by means of sets of the varieties imported into this country. During 1922–1923 a few of the hills gave economic returns and with proper cultural treatment the majority of them should give profitable yields. A liberal manuring system was adopted but owing to the lack of rain not much benefit has resulted.—Figures given of manurial treatment and yields of green-hops and brewery per acre, analyses of hops and brewery reports indicate that the quality of the 1924 crop, though somewhat deficient in condition, is still good. The color is satisfactory and the aroma all that could be desired. The percentage of resins is unfortunately lower than one could wish and below the imported standard by about 2%. The ratio of hard to soft is rather high for a new hop, and there is also a deficiency in lupulin as compared with imported hops. This may be overcome when the ground has been worked into a better state of fertility. The cost of production at George amounts to approximately £50 per acre and it would therefore be necessary to produce from 15 to 20 hundred-weight per acre to make the industry worth the undertaking.—*L. I. Goldblatt.*

7. Anonymous. **[Report of the ninth agricultural exhibition of the Central Agricultural Experiment Station of the Ministry of Agriculture and Commerce.]** (In Chinese.) Jour. Ministry Agric. and Commerce Republic of China 11^3: 18. 1924.—The experimental results of the different undertakings of the Station are given in tabulated form. Special accounts as to the nature and scope of work done by the Department of Entomology and the Department of Extension are made in detail.—*C. Y. Chiao.*

8. Anonymous. **Soft corn—How to store and feed it.** Illinois Agric. Exp. Sta. Circ. 293. *1–16. Fig. 1–7.* 1924.—A brief discussion of methods of storing soft corn, including drying in the field, ensiling, methods of ventilating cribs, and of drying with heated air; and of feeding soft corn, including hogging down, making ear-corn silage. A chart is given for determining the worth of soft corn on a basis of its dry matter content as compared with No. 1 corn at various prices.—*F. D. Richey.*

9. Anonymous. **The value of fallowing.** Agric. Gaz. New South Wales 36: 390. 1925.—Yields are given for wheat on new land, fallowed land, and stubble, in the different districts of New South Wales and for the province as a whole.—*L. R. Waldron.*

10. Anonymous. **Thirty-seventh annual report of the Pennsylvania Agricultural Experiment Station for the fiscal year ending June 30, 1924.** Pennsylvania Agric. Exp. Sta. Bull. 188. *1–31. 1 fig.* 1924.—This report is a brief summary of progress in research at this institution for the period indicated.—*H. W. Thurston, Jr.*

11. Anonymous. **United States grades for shelled white Spanish peanuts.** U. S. Dept. Agric. Dept. Circ. 304. *1–2.* 1924.

12. Arnold, E. R. G. **Simplified method for the determination of the polarization of bagasse.** Internat. Sugar Jour. 27: 323–324. *Fig. 1–3.* 1925.—With a view to bringing it nearer to the ideal, the author makes some suggestions for the improvement of the cold method of analysis of bagasse.—*Nellie E. Fealy.*

13. Arthur, B. M. **Farmers' experiment plots. Winter fodder trials, 1924. Western district (Dubbo Centre).** Agric. Gaz. New South Wales 36: 467–468. 1925.—The objects of these experiments were to determine the best methods for securing maximum use of the land, in conjunction with the proper rotation, for producing an adequate supply of succulent green feed, associated with the addition of humus to the soil.—*L. R. Waldron.*

14. Aune, Beyer. **Work of the Belle Fourche Reclamation Project Experiment Farm from 1919 to 1922, inclusive.** U. S. Dept. Agric. Dept. Circ. 339. *1–48. Fig. 1–10.* 1925.—Deals with crop conditions, rotation problems, silage crops, alfalfa seed production, variety tests, tree planting, dry-land farming, utilization of crops, harvesting, pasture grasses and the establishment of grass pastures.—*L. R. Hesler.*

15. Backer, C. A., and D. F. Van Slooten. **Geillustreerd Handboek der Javaansch Theeonkruiden en hunne Beteekenis voor de Cultuur. [Illustrated handbook of Javan tea**

weeds and their significance to tea culture.] *240 p. 240 pl.* Ruygrok & Co.: Batavia, Java, 1924.—This handbook, issued by the Algemeen Proefstation voor Thee consists of full descriptions of 240 species of plants that occur either spontaneously or planted in Javan tea plantations. Each species is illustrated by an excellent plate, the species considered being arranged according to the Engler and Prantl system. The economic significance of each is fully indicated.—*E. D. Merrill.*

16. Baranskii, D.] Баранский, Д. **Выколашивание пшениц и ячменей, как критерий степени скороспелости их.** [**Heading out of wheat and barley as a criterion of their degree of earliness.**] Сельско-Хоз. Опытн. Дело. [Agric. Exp. Work.] 3. *104–110.* 1923.—On the strength of a series of correlation tables, the author comes to the following conclusion: In order to ascertain a difference in earliness of less than 6 days we may avail ourselves of the moment of the escape of the ear, provided the varieties under investigation are populations; if they are pure lines we have to resort to a direct estimate of earliness.—*E. Sinskaja.*

17. Barnes, Earl E. **The function of annual legumes.** Jour. Amer. Soc. Agron. **17**: 403–409. 1925.—Annual legumes rank high as fixers of nitrogen and if a summer annual is followed by a winter annual like vetch as a cover, it might be possible to have a suitable substitute for common biennials in regard to both nitrogen and organic matter.—*F. M. Schertz.*

18. Barron, John H. **The utilization of legumes in the rotation.** Jour. Amer. Soc. Agron. **17**: 380–389. 1925.—In large areas of Eastern U. S. A. legume culture is a closed book because the methods recommended or the varieties available do not give satisfactory or economical returns.—*F. M. Schertz.*

19. Barron-Hay, G. K. **Pastures. Top-dressing in Western Australia.** Jour. Dept. Agric. Western Australia 2nd Ser. **2**: 51–64. *6 fig.* 1925.—Experiments were inaugurated for the purpose of demonstrating the value of top-dressing, and of endeavoring to find the most economical manure to apply. In 11 comparable trials in 1923 in which no manure, 1 hundredweight of superphosphate, and 2 hundredweight of superphosphate were compared, the yields on a percentage basis, considering the "no manure" plots as 100 and rating the others accordingly, ranged from 100, 120, and 160, respectively, to 100, 308, and 467. The average for the 11 trials was 100, 204, and 270, respectively. The 11 trials represented 11 different localities. The same comparisons in 1924 at 21 different places showed a range from 100, 111, and 142, respectively, to 100, 830, and 830, with an average for the 21 comparisons of 100, 258, and 305. It was concluded that superphosphate is to be preferred to other phosphatic manures, producing just as good results as other phosphatic manures and being the cheapest kind. The quantity of herbage as measured by percentage of leguminous plants was superior on the manured plots.—*P. J. Olson.*

20. Bartlett, H. **Farmers' experiment plots. Wheat and oat experiments, 1924.** Agric. Gaz. New South Wales **36**: 393–401. 1925.—Results are given from 7 (pure seed wheat) areas where wheat is grown under inspection for distribution as pure seed at a reasonable increase above market price. Detailed data are given upon experiments having to do with wheat varieties, fertilizers treatments, rates of seeding, fungicide experiments, and crop-harrowing trials.—*L. R. Waldron.*

21. [Barulina, E.] Барулина, Е. **О засорении посевов хлебов однозернянкой в Крыму.** [**Triticum monococcum as an admixture to cereal crops in the Crimea.**] Труды по Прикладной Ботанике и Селекции. [Bull. Appl. Bot. and Plant Breed.] **14**: 136–139. 1925.—For the purpose of studying the distribution of *Triticum monococcum* L. in the Crimea, the author visited the environs of Simferopol, Sevastopol (Balaklava) and the valley of Baidary on the southern seacoast. In none of these districts were there found pure crops of *T. monococcum.* The Tartarian sowings of *T. dicoccum farrum* Bayle and "Krimka" wheat showed admixtures of oats and of different forms of *T. monococcum cereale. T. monococcum aegilopoides* Asch. and Gr. is seldom met with in the crops themselves; it usually grows along ridges and borders of fields. In Balaklava a great number of different races, as well as 5 new varieties of *T. monococcum aegilipoides* were found.—*E. Barulina.*

22. Bennett, H. H. **Agriculture in Central America.** Jour. Amer. Soc. Agron. **17**: 318–326. 1925.—There are 4 types of agriculture in Central America: specialized farming

represented by bananas, coffee and sugar; general farming which includes corn, beans, rice, fruit and vegetables for local consumption; livestock and patch farming. Development of large agricultural possibilities is predicted.—*F. M. Schertz.*

23. Born, Otto. **Noch einige Klarstellungen und Ergänzungen zu den Versuchen der D. L. G. über die Stickstoffdüngung des Winterroggens.** [**Some explanations and comments regarding the D. L. G. experiments on fertilizing winter rye with nitrogen fertilizers.**] Mitteil. Deutsch. Landw. Ges. 40: 591–592. 1925.—A brief note with curve regarding the relation between increases in amounts of ammonium sulphate and profits in accordance with the law of decreasing returns.—*A. J. Pieters.*

24. Bosman, G. J. **Record maize farming on the high veld.** Jour. Dept. Agric. Union South Africa 9: 204–208. *1 pl.* 1924.—This is a report on the largest maize farming project in South Africa and probably the largest individual undertaking in the world. The crop of maize reaped is over 103,000 bags, and in addition a potato crop of over 70,000. The conditions and prevailing methods in force on this farm (area, roughly 4,000 morgen) are outlined. The average yield of maize is about 16 bags per acre, which is phenomenal when compared with an average yield in the Union of South Africa of between 2–3 bags per acre.—*L. I. Goldblatt.*

25. Bracken, Aaron F. **Losses in harvesting and threshing grain.** Jour. Amer. Soc. Agron. 17: 508–514. 1925.—In combined harvester-threshers, clogging of the sieves by beards was found to be a common cause of loss of grain.—*F. M. Schertz.*

26. Bretignière, L. **La répartition des variétés de blés en France.** [**The distribution of varieties of wheat in France.**] Rev. Bot. Appl. et Agric. Coloniale 2: 785–792. *2 maps.* 1922.—Climatic differences in France have brought about strains of wheat suited to local conditions; these include Blanc de Flandre, Barbu de Champagne, and the Alsatian varieties, Seille and Altkirch. The southeastern varieties, Saisettes and Tuzelles, are resistant to drought. Blé de Rousillon grown on poor land exposed to scald, is replaced by Bladette and Blanc varieties in the Garonne basin, wherever conditions are favorable. In Brittany and Normandy and the Paris Basin the improved wheats have largely replaced Francs Blés à barbes and Chicots sans barbes. For nearly 100 years Spanish, Russian and Italian wheat varieties have been increasingly grown on the plains of southern and central France; in the middle of the 19th century English wheats were introduced into northern and northwestern France, but only 2 varieties now remain.—About the end of the last century Vilmorin originated many new varieties by crossing. Other plant breeders have tried to develop wheats especially adapted to different parts of the country. For example, Denaiffe, in northeastern France has obtained types resistant to cold; and Benoist, at Beauce, has developed varieties especially adapted to rich soils.—*Frederick V. Rand.*

27. Brown, D. D. **A note on the southern Rhodesia cotton crop. Season 1923–1924.** Rhodesia Agric. Jour. 21: 745–746. 1924.—This is a short review of the 1923–1924 cotton season, the 1st in which cotton was grown on a profitable scale. About 51 tons of seed were planted on approximately 3,500 acres of land. The weather conditions were favorable and the average yield per acre over the whole colony was in the region of 600 pounds of seed cotton, but yields up to 1,500 pounds were recorded by some growers. The total crop amounted to 1,300 bales of lint valued at £31,000 and seed to the value of £15,000. The good quality of the crop was very favorably commented on.—*L. I. Goldblatt.*

28. Brown, D. D., and G. N. Blackshaw. **Cotton culture in southern Rhodesia.** Rhodesia Agric. Jour. 21: 530–542. *10 fig.* 1924.—Most aspects of cotton culture are fully discussed with special reference to Southern Rhodesian conditions. The following items are dealt with: Soils, preparation, etc.; planting, thinning, cultivating, harvesting, and selection of seed.—A section of the article contributed by the Agricultural Chemist deals with the manuring required for cotton production, and the method of application of fertilizer dressings, etc.—*L. I. Goldblatt.*

29. [Bukasov, S. M.] Букасов, С. М. **Сорта картофеля и их классификация.** [**Varieties of potatoes and their classification.**] Труды по Прикл. Бот. и Селекц. [Bull. Appl. Bot. and Plantbreed.] 13^3: 43–71. 1923.—In the 1st part of the paper the history of the problem is given; the 2nd part contains an account of investigations by the author of a vast quantity of material at the Bureau of Applied Botany and Plant Breeding. The author

founds his classification on the most constant characters, namely, color of corolla, sprouts and tubers. In smaller groups, the most constant character, as compared to the others, is the shape of the leaf. Further, the author gives a scheme of characters in the order of their systematic value for establishing sub-groups and races and also gives a scheme of the classification of varieties. So far, this scheme is of theoretical but not of practical importance and only indicates on what lines further work will be carried on.—*E. Sinskaja.*

30. Bunker, F. H. **La selección de semilla de tabaco en Puerto Rico.** [**Selection of tobacco seed in Porto Rico.**] Rev. Agric. Puerto Rico **14**: 155–157. 1925.—A much neglected phase of tobacco culture in Porto Rico is seed selection. With few exceptions none of the plantations grow a uniform variety. Directions are given, including selection of desirable plants, bagging, and harvesting of the seed.—*John A. Stevenson.*

31. Bunker, F. H. **Notas sobre el cultivo del tabaco de Puerto Rico.** [**Notes on tobacco cultivation in Porto Rico.**] Rev. Agric. Puerto Rico **13**: 389–395. 1924; **14**: 17–27. 1925.—The author discusses tobacco culture as practised in Porto Rico, including preparation of the soil, use of seed beds, planting, cultivation, fertilization, harvesting and curing. A number of varieties are grown, including Virginia blanco, Vergamota, and Comerio, but as a rule little attention is paid to selection or to keeping varieties separate.—*John A. Stevenson.*

32. Burlison, W. L., and W. P. Flint. **Fight the chinch bug with crops.** Illinois Agric. Exp. Sta. Circ. 268. *1–15. Fig. 1–7.* 1923.—Since chinch bugs feed on grasses only, it is recommended that farmers grow crops other than grasses in order to reduce chinch bug infestation. Important crops on which chinch bugs will not feed or multiply are soybeans, cowpeas, fodder beets, buckwheat, sunflowers, and rape. Information concerning the culture of these crops constitutes the main part of the circular.—*H. A. Lunt.*

33. [Bushinskii, V. P.] Бушинский, В. П. **Природные у словия роста "Чия" (Lasiagrostis splendens Kunth.)** и возможность введе ния его в культуру. [**Natural conditions of growth in "Tshee" (Lasiagrostis splendens Kunth.) and the possibility of introducing its cultivation.**] English summary. Труды по Прикл. Бот. и Селекц. [Bull. Appl. Bot. and Plantbreed.]. **13**[2]: 253–268. 1923.—The author comes to the following conclusions: (1) The utilization of "Tshee" as a special fodder crop is of doubtful value, owing to its poor qualities; (2) its presence on salt-soils is no test of its endurance in regard to great concentrations of salt solutions, for its root system spreads in the underlying layers, where the concentration of solutions is less; (3) considering the vegetative qualities of the plant, the control of salt-soils by means of cultivating "Tshee" is not to be desired; (4) the problem of introducing other wild plants into cultivation for the same purpose deserves serious consideration; (5) further experiments are necessary to find more suitable varieties and at the same time to learn how to control "Tshee" as a weed.—*E. Sinskaja.*

34. Carlson, F. A. **The effect of soil structure on the character of alfalfa root-systems.** Jour. Amer. Soc. Agron. **17**: 336–345. 1925.—Studies were made on varieties and strains grown in field plots offering different kinds of soil structure, in tanks filled with different classes of soil and in water cultures. In compact soil all varieties and strains developed branch roots, while in open soil the tap roots predominate.—*F. M. Schertz.*

35. Carne, W. M., and C. A. Gardner. **Cluster clover (Trifolium glomeratum).** Jour. Dept. Agric. Western Australia 2nd Ser. **2**: 95–97. *1 fig.* 1925.—This clover is regarded as one of the most useful of the annual pasture plants, and among the clovers is probably next to Subterranean in importance. The plant is described as to its botanic and economic characteristics.—*P. J. Olson.*

36. Carter, C. E., and P. F. Schowengerdt. **A statewide campaign for more legumes.** Jour. Amer. Soc. Agron. **17**: 431–439. 1925.—In Missouri "Clover and prosperity" is the state slogan and every effort is being put forth to increase the acreage of legumes.—*F. M. Schertz.*

37. Chevalier, Aug. **Sur les Légumineuses de la tribu des Téphrosiées cultivées dans les pays tropicaux pour capture le poisson: leurs usages et leur distribution géographique.** [**Legumes of the tribe, Tephroseae, cultivated in tropical lands for catching fish: their usage and geographical distribution.**] Compt. Rend. Acad. Sci. Paris **180**: 1520–1523. 1925.—*Tephrosia, Mundulea,* and *Galega* are discussed.—*C. H. Farr.*

38. Clark, J. Allen, and S. C. Salmon. **Kanred wheat.** U. S. Dept. Agric. Dept. Circ. 194. *3–13.* 1921.—A pure-line selection from Crimean, a hard red winter wheat of the Turkey type imported from southern Russia, and grown on large acreage in Kansas and other hard winter-wheat states. Developed at the Kansas Station, it is resistant to forms of leaf rust and stem rust which occur in that region. In addition to being rust resistant, it possesses other requisite commercial qualities.—*L. R. Hesler.*

39. Clayton, E. S., and H. Bartlett. **Fallow and crop competitions. Reports of judges.** Agric. Gaz. New South Wales 36: 381–389. 1925.—This article mainly discusses methods of preparation of land for cropping. The value of green manure is briefly referred to.—*L. R. Waldron.*

40. Coffman, Franklin A. **Experiments with cereals at the Akron (Colorado) Field Station in the 15-year period, 1908 to 1922, inclusive.** U. S. Dept. Agric. Dept. Bull. 1287. *1–62. Illus.* 1925.—The objects of these experiments were to determine the best cereal crops, varieties and strains; to improve the cereals by breeding; and to determine the best methods of production. The history of the district and brief descriptions of the soil, native vegetation and climatic conditions are given. The relation of June precipitation to wheat yields is emphasized and graphically shown. The importance of the various cereals and the acreages of the more important ones are shown by distribution maps. The nature and scope of the experiments at Akron, including rotation, soil preparation, replication of plats, rates and dates of seeding, and nursery methods, are explained. Experiments with the different cereals are discussed separately. It is concluded that fallowing for cereals is unprofitable. Winter wheat is the most important as well as profitable cereal grown. Kanred and Turkey are the highest yielding varieties. The best results have been obtained from seeding winter wheat as early in the fall as climatic conditions and soil moisture justify. Seedings of at least 3 pecks per acre for both winter and spring wheat have produced the highest average yields.—Corn ranks 2nd to winter wheat in importance in the district and rather extensive corn-breeding investigations have been conducted at Akron. Some promising selections have resulted. Only locally adapted, early varieties such as Akron, Fulton, and Minnesota No. 13 are recommended. Only early-maturing varieties of spring wheat, barley and oats are recommended and seeding should be done as early as possible in the spring. The varieties recommended are Peliss, Arnautka, Akrona and Converse spring wheat; Coast and Smyrna barley; and Kherson, Albion, and Colburt oats. Experiments show winter rye does not equal winter wheat in yield; and spring rye, emmer and spelt are considered of little value. Winter rye is recommended for growing on the more sandy soils as it is more resistant to soil blowing than winter wheat. Hershey or proso yields well in some years, but an uncertain market demand makes the production of the crop usually undesirable. Buckwheat seldom has yielded well, and flax has produced poor yields in most years when grown. Most grain sorghum varieties usually mature too late for the district, but selection experiments conducted at Akron with a few grain sorghums have resulted in the development of several promising strains.—*Author.*

41. Cooper, M. R., and C. R. Hawley. **Cost of producing field crops, 1923 (corn, wheat oats, potatoes, and cotton).** U. S. Dept. Agric. Dept. Circ. 340. *1–27.* 1925.

42. Crandall, F. K., and Burt L. Hartwell. **A comparison of four legumes as regards their ability to withstand winter conditions and increase the yields of the truck crops following.** Jour. Amer. Soc. Agron. 17: *363–367.* 1925.—Red clover was superior to alfalfa, biennial sweet clover and winter vetch in germination and growth when seeded in late summer or early fall. It also withstood winter conditions best. Truck crops following red clover have yielded more heavily than when grown after alfalfa, winter vetch or biennial sweet clover.—*F. M. Schertz.*

43. Dawson, C. A. **Fertilization of sugar beets.** South African Fruit Grower 11: 405–407. 1924.—The effects of different fertilizers and farm manure on the yield of sugar beets and the percentage of sugar are discussed. There is no indication from the figures given that nitrogen should be supplied in addition to manure, but practice has demonstrated that this is often profitable. On South African soils that have long been under cultivation, especially with a preponderance of non-leguminous crops, the humus and nitrogen content

is likely to be low. The main advantage of manure over commercial fertilizers is that it contains a large amount of humus-forming materials. Since sugar beets are best grown on loam soils the effect of humus on the texture of the soil is not of such importance as it would be in the case of a clay soil. Whenever the soil chosen tends to be heavy the humus value of manure is of great importance in the climate of South Africa, as its favorable effect on the soil texture will be badly needed.—*L. I. Goldblatt.*

44. Dean, H. K. **Work of the Umatilla Reclamation Project Experiment Farm in 1920, 1921, and 1922.** U. S. Dept. Agric. Dept. Circ. 342. *1–24.* 1925.—Alfalfa, crops produced, weeds, crop experiments, duty-of-water experiments, alfalfa varieties, manure, corn variety tests, and fertilizer tests are discussed.—*L. R. Hesler.*

45. Dedek, Jar. **Czecho granulated, its quality and production.** Internat. Sugar Jour. **27:** 308–310. 1925.—Czecho-Slovakia's answer to the sometimes adverse statements as to whether white sugar can be manufactured directly from beets, is that from its year's estimated production of some 900,000 to 1,000,000 tons of granulated sugar about 200,000 to 250,000 tons were made directly from beets, the remainder being produced from washed raw sugars with the aid of bone char or vegetable carbons. The causes leading to the equipment of all Czecho-Slovakian export refineries with large bone char and vegetable carbon plants and the conditions required for successful operation are enumerated, and the latter and the use of decolorizing carbon are discussed. Of the various active carbons tried out in Czecho-Slovakia in recent years the "Norit" has proved the most successful. Even hard sugars of high quality have been boiled from Norited thick juices. Considered from the standpoint of boiling system there are 3 types of factories: (1) Those boiling granulated only from the pure thick juice and selling their molasses sugars; (2) those boiling the thick juice to raw sugars, washing, melting, and boiling their white sugar from these liquors; and (3) a mixed type of both of these factories which melts the washed molasses sugars, unites the liquor with the thick juice, and boils the mixture to white sugar. The relative merits of each are briefly stated.—*Nellie E. Fealy.*

46. [Dekaprelevich, L.] Декапрелевич, Д. **К изучению пшениц Азербейджана. [Investigation of wheats of Azerbeidzhan (Eastern Transcaucasia).]** Известия Тифлисского Государст венного Политехнического Института. [Bull. State Polytech. Inst. Tiflis] **1:** 97–108. 1924.—The plant breeding division of the Botanical Garden in Tiflis has investigated the wheat forms in the northern districts of the provinces Bakou and Elisavetpol. Separate regions are distinguished by the uniformity and the similarity of the form material. In the zonal distribution of the wheat varieties a certain regularity has been observed.—*E. Sinakaja.*

47. Denniston, R. H. **The anatomy of the leaf of a new fibre plant.** Ann. Appl. Biol. **12:** 307–313. 1925.—A description of the leaf and its anatomy, with 9 test figures, is given. The fibers consist of cylindrical bundles of thick-walled cells in the bast of the outer side of the leaf and lunar-shaped bundles on the outer and inner margins of each fibro-vascular bundle. These fibro-vascular bundles are arranged thickly in a single row at the inner edge of the bast tissue. The cells are alike in the 2 kinds of fibers. The ultimate cells are 2.8–6.8 mm. long and 0.088–0.027 mm. thick. The average width to length is as 1 to 565. Tests with microchemical reagents are given.—*Lyster H. Dewey.*

48. [Drozdov, N. A.] Дроздов, Н. А. **Дикая и культурная однозернянка в Крыму. [Triticum monococcum aegilopoides Asch. & Gr. (Tr. aegilopoides Pers.) and Tr. monococcum cereale Asch. & Gr. in Tauria.]** (English summary.) Труды по Прикл. Бот. и Селекции. [Bull. Appl. Bot. and Plantbreed.] **13**[1]: 515–524. 1923.—Wild small spelt grows in the vicinity of the Tartarian settlement, "Baidary." Cultivated small spelt has also been met with in 2 localities of the Crimea. The author himself has found 4 varieties.—*E. Sinskaja.*

49. Ducomet, Vital. **Deux ans d'expériences sur la pomme de terre au centre national d'expérimentation de Grignon. [Two years experiments with the potato at Grignon.]** *16 p.* Libraire Agricole de la Maison Rustique: Paris, [1923?].—The author discusses the results obtained from his 2 years' study (1921 & 1922) of the following subjects: Cultivated varieties of potatoes, their origin, synonymy and purity of the stock; degeneracy diseases; filosite;

Phytophthora; Verticillium; Rhizoctonia; blackleg and streak; varietal adaptation; selection; comparison of home-grown selected stock with that of imported stock, with list of superior varieties; and multiplication of individual selections. In his concluding remarks the author states that it is a good thing to reassemble in 1 place the largest possible number of varieties obtainable from different countries in order to determine their relative merits and defects. He is careful to state that rational or satisfactory comparisons cannot be made with impure or diseased stock.—*W. Stuart.*

50. Erith, Adela G. **White clover (Trifolium repens L.). A monograph.** *150 p. 81 fig.* Duckworth & Co.: London, 1924.—This monograph is the 2nd of a series of monographs on agricultural plants, edited by John Percival, Professor of Agricultural Botany, University College, Reading. In the introductory chapter the distribution of white clover is traced. In chapter 2, the morphology and anatomy of the seed is described in detail; this is followed by an account of the germination of the seed and the morphology and anatomy of the seedling. The conditions necessary for germination and the treatment of "hard" seed are discussed. The external and internal structure and the development of roots, stems and leaves are fully treated in the following 3 chapters. A short chapter is devoted to the structure and development of the inflorescence; this is followed by a long chapter in which the structure and detailed anatomy of the flower is described, with a complete account of anthesis, pollination, fertilization and development of the seed. "The anther is exceptional, producing only two microsporangia, and is bilocular instead of quadrilocular as in the majority of Phanerogams." The behavior of the nucleoli of the endosperm cells during their development is noteworthy. In the following chapter the development of the flower is described and illustrated with original figures. The diploid number of chromosomes is 16. The next chapter is allotted to the classification of the varieties and cultivated races of white clover, and a concise description of each is given. The morphology, anatomy and cytology of *T. repens* var. *sylvestre*, and its cultivated races, *hollandicum* and *giganteum* are compared. The race *giganteum* is regarded as a gigas, and the race *hollandicum* as a semi-gigas form of var. *sylvestre;* the chromosome number in both races, however, is the same as in var. *sylvestre*. The cyanophoric property of the varieties and races is described. Whereas plants of var. *sylvestre* are nearly always cyanophoric, those of the 2 cultivated races mentioned above are almost without exception, acyanophoric. This systematic chapter is followed by a very complete account of the teratological forms of white clover which "is remarkable for the extraordinary multiplicity" of such forms. The book concludes with a chapter on the agricultural value of wild white clover, white Dutch clover, and Lodi or giant white clover. A comprehensive bibliography is given.—*Author.*

51. Evans, J. A., J. C. Hackleman, and F. C. Bauer. **Cotton growing in Illinois.** Illinois Agric. Exp. Sta. Circ. 279. *1–8. Fig. 1.* 1924.—These brief directions for the growing of cotton in Illinois are written in popular language.—*H. A. Lunt.*

52. Fisher, O. S. **Extension work in agronomy.** U. S. Dept. Agric. Dept. Circ. 343. *1–14.* 1925.—Discussion of extension work dealing with such topics as crop, seed, and soil improvement, with a statistical summary of results.—*L. R. Hesler.*

53. Fisher, O. S. **The relation of the legume program to other extension projects.** Jour. Amer. Soc. Agron. **17**: 418–430. 1925.—The legume program must be economically sound and a fundamental part of the entire production program of the extension worker. The percentage of legumes per cultivated acreage is gaining but has not by any means reached the goal set for it.—*F. M. Schertz.*

54. [Fliaksberger, K.] Фляксбергер, К. **О пшеницах Хорезма (Хивы).** [**The wheats of Khoresm (Khiva).**] Труды по Прикладной Ботанике и Селекции. [Bull. Appl. Bot. and Plantbreed.] **14**: 1–23. *4 fig.* 1924.—The author comes to the conclusion that the wheats of Khiva originated from Bokhara and not from Turkestan. This statement is based on the frequent occurrence of awnless varieties in Khiva. Almost no awnless varieties are grown in Turkestan, while their extensive culture may be observed in mountainous Bokhara. These data confirm the view held by N. I. Vavilov as to the center of origin of soft and club wheats being in mountainous Bokhara, Afganistan, Baluchistan.—*E. Sinskaja.*

55. Flint, W. P. **Chinch bug barriers.** Illinois Agric. Exp. Sta. Circ. 270. *1–8. Fig. 1–3.* 1923.—This circular describes the construction and effectiveness of the following types of barriers: Creosote, coal tar, kerosene and limestone, and dust. Other means of controlling the chinch bug are discussed.—*H. A. Lunt.*

56. Flint, W. P., and W. V. Balduf. **Calcium cyanide for chinch-bug control.** Illinois Agric. Exp. Sta. Bull. 249. *73–84. Fig. 1–5.* 1924.—The use of calcium cyanide to keep corn fields free of chinch-bugs is described. It is most effectively used in combination with creosote or coal-tar barriers. Directions are given for the making of creosote and coal-tar barriers, as well as precautions to be observed in handling calcium cyanide.—*H. A. Lunt.*

57. Flint, W. P., and J. C. Hackleman. **Corn varieties for chinch-bug infested areas.** Illinois Agric. Exp. Sta. Bull. 243. *540–550. Fig. 1–5.* 1923. Observations in the field indicated that several varieties of corn show resistance to the chinch-bug. Tests covering 5 years on several different fields revealed the fact that Champion White Pearl, Democrat, Black Hawk, Golden Beauty, and Mohawk are the most resistant of the varieties tried. This resistance applies only to the 2nd brood of chinch-bugs. Barriers should be used to protect all varieties from the 1st-brood infestation.—*H. A. Lunt.*

58. Florell, V. H. **Biannual cropping of wheat hybrids.** Jour. Amer. Soc. Agron. **17:** 354–356. 1925.—California offers climatic conditions suitable for growing 2 generations of wheat, barley and oats in 1 year. These conditions assist in creating new varieties of cereals by hybridization.—*F. M. Schertz.*

59. Florell, Victor H. **Cereal experiments at Chico, California.** U. S. Dept. Agric. Dept. Bull. 1172. *1–33. Fig. 1–5.* 1923.—The principal lines of investigation (1910–1912) included varietal experiments with wheat, barley and oats, and breeding and classification studies with wheat. Limited experiments were conducted with emmer, spelt, flax, and grain sorghums, including tests as to the best dates for seeding cereals. The topography, soil, and climate of the Sacramento Valley, as well as that of the Plant Introduction Station are discussed. Spring varieties of wheat, barley and oats, when fall sown, survive the winter equally well with winter habit varieties.—The white common wheats are grown almost exclusively in the Sacramento Valley. Varieties of Australian origin are best adapted. Among the highest yielding varieties grown in field plats were Pacific Bluestem, Baart, Hard Federation, White Federation and Little Club. Milling and baking experiments showed Hard Federation and Baart to be superior for bread making purposes. Hybridization experiments to improve leading varieties from the principal wheat producing sections of the western half of the U. S. A. were begun at Chico in 1919.—Barley is the most important grain crop of Sacramento Valley. Coast, Beldi, Trebi, and Club Mariout were among the highest yielding 6-row varieties in the field plat experiments, while Smyrna, the leading 2-row variety, did not yield as well as Coast.—Fulghum was the most promising variety of oats. Emmer and spelt have not yielded as well as barley. Flax is not adapted. Grain sorghums may be grown successfully. Dwarf milo was found to be one of the best varieties.—Largest yields of wheat, barley, oats, and flax were obtained when sown before December 31.—*Author.*

60. Floyd, A. G. **Observaciones sobre el cultivo del algodon en Puerto Rico.** [**Observations on cotton culture in Porto Rico.**] Rev. Agric. Puerto Rico **12:** 169–171. 1924.—A general discussion of cotton culture as carried on in the semi-arid regions of western Porto Rico, with recommendations for obtaining profitable yields.—*John A. Stevenson.*

61. Funchess, M. J. **The utilization of legumes in the rotation.** Jour. Amer. Soc. Agron. **17:** 398–403. 1925.—It is possible to use legumes in the cropping system of the southern U. S .A. much more intensively than they have been used in the past. The prevailing climatic conditions are favorable to a rapid depletion of soils, but these climatic conditions are also favorable for a much greater use of those crops which help to maintain soil fertility. —*F. M. Schertz.*

62. Gaines, W. L., and W. B. Nevens. **The sunflower as a silage crop.** Illinois Agric. Exp. Sta. Bull. 268. *407–455. Fig. 1–29.* 1925.—This bulletin deals with the composition and yield of sunflowers at different stages of maturity, and also makes some comparisons between sunflowers and corn as silage crops.—*H. A. Lunt.*

63. [Gol'bek, A. K.] Гольбек, А. К. **Гладкоостый. [Smooth-awned rice.]** Труды по Дрик ладной Ботанике и Селекции. [Bull. Appl. Bot. and Plantbreed.] **14**: 177–184. 1925.—The rices of Central Asia fall into 2 groups: (1) Rice with elongated and large grains, and (2) rice with roundish (short) and small grains.—Forms belonging to the 1st group and the majority of the 2nd show a strong dentation of the paleae and the awns; these forms are coarsely rough-awned. A small portion of forms of the 2nd group show a slighter dentation of the paleae and awns; these forms are semi smooth-awned or short dentate-awned. The examination in regard to dentation of the material originating from tropical and subtropical localities has shown that in that region there occur true smooth-awned forms. In Central Asia, coarsely rough-awned rices prevail, but show admixtures of semi smooth-awned forms, the latter sometimes becoming component parts of the variety. Smooth-awned and semi smooth-awned rices are peculiar to subtropical and tropical crops, while coarsely rough-awned rices are characteristic of the dry, continental climates of Asia, and particularly of Central Asia.—*E. Barulina.*

64. Gräter, Friedrich. **Bemerkenswerte spanische Versuche zur Hebung der Getreideerzeugung in regenarmen Gebieten. [Notable Spanish experiments for increasing the yield of grain in semi-arid regions.]** Mitteil. Deutsch. Landw. Ges. **40**: 577–578. 1925.—This note is apparently based in part on a paper by Marcelino de Arana in "El Progreso Agricola y Pecuario," Madrid, No. 1394, June 15, 1925, describing a system of grain culture by which the alternate year of fallow is eliminated and more grain is produced each year than on previously fallowed land, thus more than doubling the total grain production. The grain is seeded in rows 70–90 cm. apart with 70–90 seed per meter in the row, requiring 40 kg. of seed per ha. Horse cultivation is given till about March 10, after which the spaces are kept worked by a "Grubber" (grub hoe?). In fall the new seeding is made in the middles without further preparation. The average annual yields for 5 years (1919–1920 to 1923–1924) are given as 866.4 kg. per ha. on fallow and 1095 by the new system.—*A. J. Pieters.*

65. Hackleman, J. C. **Corn growers face worst seed shortage in years.** Illinois Agric. Exp. Sta. Circ. 292. *1–4. Fig. 1–4.* 1924.—A timely discussion of the seriousness of the seed corn shortage for the 1924 season, together with brief directions for selecting and storing seed corn.—*H. A. Lunt.*

66. Hall, Thos. D. **Profitable potato production.** Jour. Dept. Agric. Union of South Africa **9**: 461–465. *2 fig.* 1925.—Apart from demonstrating the value of fertilizers in producing quality as well as quantity in potatoes, an attempt was made to ascertain the most profitable amounts of superphosphate, sulphate of ammonia, and sulphate of potash to use. The following conclusions were arrived at: Fertilizing potatoes on a virgin high-veld, sandy loam is profitable, the quantity being increased and the quality improved. The increase of No. 1 grade is very marked, while the amount of the lowest grade is not affected. The phosphate constituent of the fertilizer mixture was the only one which paid with certainty, and this constituent paid for the others. On soils that have been cropped for some years it is likely that nitrogen and potash in addition will also pay on the potato crop. Super phosphate at the rate of 300 pounds per acre made a difference of 44 bags. The results of using a mixture of 3 parts of superphosphate to 1 of bonemeal at the rate of 800 pounds per acre indicated that dressings of the former heavier than 300 pounds per acre are likely to be still more profitable. The cooking properties of fertilized potatoes were superior to those of unfertilized ones. Although the potato crop pays for the fertilizer, 2 or 3 other crops such as teff and maize also derive great benefit from the residues and give increased yields and more profitable returns over a period of 2 or 3 years.—*L. I. Goldblatt.*

67. Hansen, Dan. **Work of the Huntley reclamation project experiment farm in 1922.** U. S. Dept. Agric. Dept. Circ. 330. *1–31.* 1924.—Crop rotation experiments, irrigated crops (corn and sugar-beets), and dry-land crops are discussed.—*L. R. Hesler.*

68. Harding, Richard. **Cotton in Australia: the possibilities and limitations of Australia as a cotton-growing country.** *xviii + 270 p. Illus.* Longmans, Green & Co.: London, 1924.—This book draws attention to the decrease in the world's cotton production and to the need for finding new sources of supply, as a cotton crop failure in America would be a world-wide calamity. Before directing attention to Australia's possibilities, a brief resumé

is given of the cotton growing countries of the world. Because of mild winters Australia ratooned her cotton, but the resultant rapid deterioration in the quality of the fiber and the higher production costs as compared to America, coupled with the difficulty of marketing the crop due to lack of transport facilities, stifled the Australian industry for the time being. The book contains some 40 full-page illustrations, together with numerous diagrams compiled from official sources, showing the average monthly rainfall and temperatures throughout the Australian cotton belt. Climatic conditions in the northern half of Australia are compared in diagram form with those of the American and Egyptian cotton growing areas, forcibly demonstrating how vast areas in Australia are admirably adapted by nature for cotton. Analyses of American, Australian and Egyptian cotton soils and soil temperatures are also given, together with cost of production figures. Stress is laid upon the vital need for breeding pure strains of cotton, an outline is given of the procedure employed on the Egyptian Government seed-breeding farms, and the need for controlling the distribution of seed is emphasized, if crop deterioration is to be prevented. Four appendices are included; these deal in a brief and concise fashion with the main bacterial and fungoid diseases of cotton in all parts of the world, and with Egyptian climatic conditions and growth periods of Egyptian cotton. Rainfall tables for the States of Queensland and New South Wales are also included. —*Author.*

69. Hartwell, Burt L., J. B. Abbott, J. P. Jones, and M. F. Morgan. **Plant nutrition in relation to a general soil fertility program.** Jour. Amer. Soc. Agron. **17**: 68–72. 1925.—In a fertility program it is necessary to know the relative response of different crops to each fertilizer element. Ratios rather than grades of fertilizers should be adopted as standards. —*F. M. Schertz.*

70. Headley, F. B., E. W. Knight, and L. E. Cline. **Work of the Newlands Reclamation Experiment Farm in 1922 and 1923.** U. S. Dept. Agric. Dept. Circ. 352. *1–26.* 1925.—Alfalfa production, variety tests of field crops and fruit, and pasture crops are discussed.—*L. R. Hesler.*

71. Holden, James A. **The work of the Scottsbluff Experiment Farm in 1920 and 1921.** U. S. Dept. Agric. Dept. Circ. 289. *1–38.* 1924.—Experiments with sugar beets, potatoes, crop utilization and range pasture are discussed. With reference to sugar beets, considerable attention is paid to rotation, cultural methods, time of planting, fertilizers, etc. Regarding potatoes, the effect of rotation and manure, potato varieties, choice of seed, time of planting and diseases are presented.—*L. R. Hesler.*

72. Holtz, H. F., and H. P. Singleton. **Comparative value of alfalfa and sweet clover on soils in the lower Yakima Valley.** Jour. Amer. Soc. Agron. **17**: 326–333. 1925.—Soils from sweet clover land had 102% greater CO_2 evolution and 95% greater nitrate N accumulation than soil from alfalfa land during the 44 days of this experiment. Sweet clover land produced 14.92 tons of silage while alfalfa land produced 8.25 tons. Sweet clover is especially adapted to supply available soil N because of its high N content and its rapid decomposition when returned to the soil.—*F. M. Schertz.*

73. Howe, W. F. Seymour. **[Cost of converting cane into power alcohol.]** Australian Sugar Jour. **17**: 104. 1925.—In connection with the question of manufacturing power alcohol from a combination of sugar cane and molasses the author gives data regarding cost and yield of different combinations.—*Nellie E. Fealy.*

74. Hughes, H. D. **The future of sweet clover in the corn belt.** Jour. Amer. Soc. Agron. **17**: 409–417. 1925.—Sweet clover is recommended by the experiment stations in nearly every state as a field crop of very general agricultural value, especially for soil improvement and for pasture, with hay and seed production as secondary considerations.—*F. M. Schertz.*

75. Hulbert, H. W. **Drill calibration and its relation to stand and yield of small grains.** Jour. Amer. Soc. Agron. **17**: 92. 1925.—A study of pea, wheat, oats and barley seeding. In variety tests with field peas the size of seed of the different varieties must be considered; with small grains, size is not so important.—*F. M. Schertz.*

76. Hyslop, G. R. **Flax in Oregon.** Oregon Agric. Exp. Sta. Circ. 60. *1–10.* 1925.—A discussion of flax culture is given, including such topics as types of flax, climatic conditions, soils, rotation (3–7 years, depending on diseases), preparation of seed-bed, seed varie-

ties, seed treatment, time of sowing, seeding rates and methods, harvesting, threshing, and retting.—*C. E. Owens.*

77. [Iakushkin, I. V.] Якушкин, И. В. **Пшеницы Крыма. [Wheats of Crimea.]** (English summary) Труды по Прикл. Бот. и Селекчии. [Bull. Appl. Bot. and Plantbreed.] 13¹: 71–147. 1922–1923. [1923.]—The author makes an analysis of varieties of wheats grown in Crimea. He finds varieties of *Triticum vulgare* prevailing. In 90 samples of spring wheats examined, the var. *lutescens* was greatly predominant, comprising 95% of the mixtures. The other varieties found were *caesium*, *erythrospermum* and *milturum*. Samples of *Triticum durum* examined were found to belong mainly to the varieties *valenciae*, *leucomelon* and *leucurum*. Of winter wheats, the var. *erythrospermum* is greatly predominant, and especially so in regions with poor soil. In regions with richer soil it is mixed with the varieties *ferrugineum*, *nigroaristatum*, and *caesium*. A variety of *erythrospermum* called "crimka" is mostly grown in Crimea. It is not considered by the author to be of great economic value, but it is important because of exceptional resistance to drought.—*M. Demerec.*

78. [Ianishevskii, D. E.] Янишевский, Д. Е. **форма конопли на сорных местах в юго-восточной России. [Form of hemp on weedy ground in Southeastern Russia.]** Учен. Записк. Государств. Саратовск. Университ. [Sci. Bull. State Univ. Saratov] II. Fasc. 3. *1–15. 1 fig.* 1924.—The author calls the weedy form of hemp, spread in southeastern European Russia, *Cannabis ruderalis*, in distinction from the cultivated form. The most important feature of this form is the integument, which develops from the perianth, closely adherent to the fruit and remaining on the latter. It is absent in the cultivated form or persists in the shape of thin fragments at the base of the fruit. In the epidermis of the perianth there is a group of pigmented cells; this accounts for the mosaic on the fruit of *C. ruderalis*. Another distinguishing feature is the elongated form of the base of the fruit, which assumes the shape of a short support. The anatomical structure of the later formation resembles the elayosoma of the plants whose fruit are disseminated by ants. The fruit of hemp are apparently disseminated by bugs.—*E. Sinskaja.*

79. Janson, A. **Ueber den Anbau von Frühkartoffels N. [Raising early potatoes.]** Garttenwelt 28: 148–149, 169–171. *2 fig.* 1924.—A general discussion is given as to the importance of early potatoes in Germany and in its markets. Before the war, Malta potatoes from Gibraltar and Cyprus were much imported in considerable quantities. The earliest varieties give lowest yields June-Nieren is the best; 6-Wochen-Nieren, which is 1 week earlier, is also good. The soil must be strongly fertilized with stable manure and chemical fertilizers, though Kainit is not recommended. Many cultural directions are given.—*J. C. Th. Uphof.*

80. Kennedy, P. B. **The Tangier pea.** California Agric. Exp. Sta. Circ. 290. *1–15.* 1925.—The Tangier pea plant is recommended as a green manure crop and also gives promise as a forage plant.—*A. R. C. Haas.*

81. Kennedy, P. B., and W. W. Mackie. **Berseem or Egyptian clover (Trifolium alexandrinum).** California Agric. Exp. Sta. Bull. 389. *1–32.* 1925.—A preliminary report is given of the annual leguminous plant, Egyptian clover. It is alkali tolerant to a considerable degree, and has been found more palatable and nutritious than alfalfa.—*A. R. C. Haas.*

82. Kenney, Ralph. **The utilization of legumes in the rotation.** Jour. Amer. Soc. Agron. 17: 389–394. 1925.—In the middle western part of the U. S. A., more stress has been laid on using legumes for soil improvement but recently legumes are being used more as cash crops, hay or pasture.—*F. M. Schertz.*

83. Kiesselbach, T. A., and Arthur Anderson. **Annual forage crops.** Nebraska Agric. Exp. Sta. Bull. 206. *1–45. Fig. 8.* 1925.—In a comparative 4-year test of 24 varieties of annual forage crops at the Nebraska Exp. Sta., the sweet sorghums proved most productive of cured forage as compared to common and German millet, alfalfa, Sudan grass, corn, sheaf oats, and kafir. Details are given. In a 7-year comparison with drilling, the yields of sorghum, Sudan grass, kafir, and field corn were reduced 14, 7, 10, and 20%, respectively, when seeded broadcast. The seeding of sorghum and Sudan grass should follow soon after corn planting. These crops were seeded during a 4-year period on May 15 and thereafter at 10-day intervals until July 5. In general the tonnage yields decreased progressively with later seedings. Relative average yields of sorghum seeded during 7 years at the rates of

25, 50, 75, 100, and 150 pounds per acre were 100, 110, 106, 113, and 114%, respectively. Corresponding relative yields for Sudan grass seeded at 20, 30, 40, 60, and 80 pounds per acre were 100, 101, 105, 106, and 107%. As a 3-year average, sorghum seeded 150 pounds per acre was but 52% as coarse (measured by stem diameters) as sorghum seeded 25 pounds per acre Sudan grass seeded 80 pounds per acre was but 65% as coarse as that seeded 10 pounds per acre. As an average for the seeding rates, the stems, leaves, and heads comprised 47.5, 35.5. and 17.0%, respectively, of sorghum and 49.7, 32.5, and 17.7% of Sudan grass. Sorghum seeded at 125 pounds per acre had the same average coarseness as Sudan grass seeded at 30 pounds. The chemical composition of sorghum and Sudan grass forage and the yield of nutrients per acre were not affected very decidedly by change in seeding rate. Highest yields can be expected from sorghum and Sudan grass if harvesting is delayed until they are rather mature even though 2 crops may be secured when harvested at more immature stages. Sudan grass will cure at a rate materially faster than that of sorghum and consequently can be stacked sooner after cutting. In a rate-of-curing test, Sudan grass had dried to 26% moisture content when sorghum still contained 46%. Since there is far less danger from prussic acid poisoning in pasturing Sudan grass than in the case of sorghum, it has a much wider use as a pasture crop. Corn planted at rates the equivalent of 1 to 6 plants per hill was found to yield the most silage at 4 plants per hill. Relative yields on a 15% moisture basis for the 1, 2, 3, 4, 5, and 6 rates were 100, 153, 173, 187, 183, and 179%, respectively. In a silage test with 5 types of corn varying as to length of growing season, it was found advantageous to grow the local, full-season types. Corn and soy beans planted in combination for silage yielded 3.95 tons of field-cured fodder per acre in contrast to 3.91 tons per acre of fodder from corn planted alone. This combination is not recommended as a silage crop in Nebraska. —*T. A. Kiesselbach.*

84. Kiesselbach, T. A., and W. E. Lyness. **Spring small grains.** Nebraska Agric. Exp. Sta. Bull. 201. *1–45. Fig. 13.* 1924.—This bulletin reports results with varietal and cultural tests of oats, spring wheat, and barley at the Nebraska Exp. Sta. The data indicate that 3 early varieties have averaged a 19% higher yield during 18 years than have 4 late varieties. Selection within a commercial variety of oats has resulted in some strains definitely superior to the original. The best strains or varieties grown pure, yield better than mixtures. Fanning mill grading of seed has failed to materially increase acre yields. In early, medium, and late seeded Kherson oats the later plantings resulted in lower yields, shorter straw, later heading and ripening, and poorer quality of grain. In a 10-year test Kherson oats planted at the rates of 4, 8, 10, 12, 14, and 16 pecks per acre, gave the respective yields of 51.5, 54.0, 55.9, 56.2, 55.9, and 55.4 bushels per acre. In a similar 10-year test with the larger seeded variety, Swedish Select, net returns from 4, 8, 10, 12, 14, and 16 pecks per acre were 36.1, 41.6, 42.8, 43.7, 42.8, and 42.1 bushels per acre. A 5-year average shows 1 bushel per acre in favor of drilling over broadcasting oats, while drilling oats at the North Platte Sub-station yielded 6.5 bushels per acre more than broadcasting. Harvesting oats slightly green, not to exceed 2 days before maturity, was found to be a satisfactory practice. Java and Marquis have proved the most productive varieties of spring wheat. Marquis grown by the Station since 1910 yielded, in a 3-year average, 0.1 bushel more than Marquis from seed received each year from northern states. Spring wheat planted early, medium and late gave decreasing yields with later seedings. Club Mariout was the highest-yielding variety of barley. Four-year average yields of various small grain crops in pounds of hull-free grain per acre are as follows: Winter wheat, 1638; winter rye, 1568; barley, 1212; spring rye, 1165; oats, 1095; spring emmer (Khapli), 977; spring wheat, 906; spring emmer (common), 817; and hull-less barley, 816.—*T. A. Kiesselbach.*

85. Kile, O. M. **Crop reporting by airplane.** Sci. Amer. **131:** 22–23. *4 fig.* 1924.—Use of the aerial camera and planimeter for the preparation of crop statistics is discussed.—*Chas. H. Otis.*

86. Kitchener, W. A. **The value of agricultural statistics.** Jour. Dept. Agric. Union of South Africa **9:** 73–79. 1924.—The history value, etc., of agricultural statistics in South Africa are discussed. Statistics taken since 1911 show that with the exception of maize ground nuts, sugar-cane (the production of which has increased 49%), tobacco, cotton and

cultivated grasses, little progress has been made as far as the area under cultivation of agricultural crops is concerned. This is striking proof of the great need for closer settlement and the more intense cultivation of the soil. On the other hand, improved methods of cultivation are undoubtedly being followed and there has been an increased yield per morgen in nearly all the crops. The morgenage under cultivated grasses has greatly increased, indicating that stock farmers are at last becoming alive to the fact that in order to protect their stock in times of drought provision must be made for fodder other than veld grasses. Considerable advance has been made in cotton growing and in tobacco and ground-nut production.—*L. I. Goldblatt.*

87. Koch, Pieter. **Cotton culture.** South African Fruit Grower 9: 233–239. *5 fig.* 1924.—The cultivation of cotton is briefly dealt with under the following heads: Botanical features, climate, soil, seed selection, varieties to grow, soil fertility and rotation, preparation of the soil, when and how to plant, cultivation, picking, ginning and preparation, cost of production.—Cotton can be grown on nearly every type of soil on which maize grows, providing it is deep and well drained. It is useful to know that the cotton plant is not subject to the attack of the witchweed.—(See also Bot. Absts. 13, Entry 5644.)—*L. I. Goldblatt.*

88. Koehler, Benjamin, G. H. Dungan, and J. R. Holbert. **Factors influencing lodging in corn.** Illinois Agric. Exp. Sta. Bull. 266. *311–371. Fig. 1–25.* 1925.—Evidence is presented to show that some of the corn root rot diseases increase the amount of lodging in corn fields, but that other factors such as climate, previous cropping, rate and time of planting, and soil treatment also affect the lodging of corn.—*H. A. Lunt.*

89. Kristensen, R. K. **Ensileringsborsof II.** [**Silage experiments.**] Tidsskr. Planteavl. 30[4]: 537–564. *Fig. 6.* 1924.—Although the growing season is too short and the climate too cool for corn, experiments are being conducted with other plants for use as ensilage. In one test, corn was grown and ensiled in mixture with sunflowers, but the silage was so sour that it was unpalatable, due probably to the green condition of the corn. Sunflowers alone and a mixture of field peas, horse beans, barley and oats seemed to give satisfactory results. The work is still in the experimental stage.—*Albert A. Hansen.*

90. [Kupriĭanov, I. M.] Куприянов, И. М. **О культуре многолетней ржи (Secale montanum Guss.) на Сочинской Садовой и С.—Х. Опытн. Станции.** [**Cultivation of perennial rye (Secale montanum Guss.) at the Agricultural Experiment Station in Sotshi (Caucasus).**] English summary. Турды по Прикл Бот. и Селекции. [Bull. Appl. Bot. and Plantbreed.] 13[1]: 509–513. 1923.—The author gives the results of his experiments with *Secale montanum* Guss. and comes to the conclusion that it might be of importance as a forage crop.—*E. Sinskaja.*

91. Langfield, J. H. **Field experiment with wheat at the Merredin Experiment Farm.** Jour. Dept. Agric. Western Australia 2nd Ser. 2: 133–137. *2 fig.* 1925.—Middle May, June, and July seeding were compared. The results were in favor of the May seeding. On account of opportune rains the June seeding made a better showing than in average years. Superphosphate applications of 75, 150, and 225 pounds were compared. Grain yields were increased 8% by the medium over the light, and 17% by the heavy over the light application. The corresponding increases in hay yields were 25 and 31%. Rates of seeding of 30, 45, and 60 pounds were compared. "Nabawa," a free-stooling, and "Florence," a sparse-stooling variety, were used. The differences in yield in both cases are insignificant. In another rate of seeding trial 45, 60 and 90 pounds were compared. In the case of the grain yield there is a progressive increase with increased rate, which, however, is of doubtful significance. The differences in hay yield are without significance.—*P. J. Olson.*

92. Lansdell, K. A. **Weeds of South Africa XIV. Weed No. 9. The milk thistle. (Silybum marianum Gaertn.). Order Compositae.** Jour. Dept. Agric. Union South Africa 9: 239–244. *Pl. 1–6.* 1924.—A description is given of this robust herbaceous annual or biennial noxious weed. It is a native of Southern Europe and is widely distributed in South Africa. It grows wild in waste places and especially in fence rows and as it bears large showy thistle-like flowers it also retains a place in the flower garden. Eradication consists of hoe-cutting the 1st-year rosettes; cultivation of the ground at once destroys these plants. They should never be allowed to set seed.—*L. I. Goldblatt.*

93. Legrand, J. F. **Siembra del algodon.** [Cotton culture.] Rev. Agric. Puerto Rico **10**[4]: 35–40. 1923.—General directions for growing Sea-Island cotton under Porto Rican conditions.—*John A. Stevenson.*

94. Leighty, C. E., and J. W. Taylor. **Electrochemical treatment of seed wheat.** U. S. Dept. Agric. Dept. Circ. 305. *1–7.* 1924.—Methods for increasing the yield of crops through the use of electricity are reviewed. Tests made at the Arlington Farm, near Washington, D. C., showed no benefit or profits from treating seed wheat by the so-called "Wolfryn" process. No effect of the treatment on plant growth or disease infection could be observed.—*L. R. Hesler.*

95. Leonhards, R. **Untersuchungen über den Einfluss stiegender Phosphorsäuregaben auf den Ertrag unserer wichtigsten Kulturpflanzen.** [Investigations on the effect of increasing amounts of phosphoric acid on the yields of the most important crops.] Mitteil. Deutsch. Landw. Ges. **40**: 557–560. 1925.—An analysis of a large number of experiments with rye and potatoes as indicator crops to determine the profitableness of applications of phosphoric acid.—*A. J. Pieters.*

96. Lloyd, W. A. **An extension program in crop production to re-enforce range livestock, dairying, and human nutrition for the western states.** U. S. Dept. Agric. Dept. Circ. 335. *1–15.* 1924.—Reports of committees at a conference held at Fort Collins, Colorado.—*L. R. Hesler.*

97. Lowe, G. N. **Cultivation of the potato.** Jour. Dept. Agric. Western Australia 2nd Ser. **2**: 41–42. 1925.—This consists of a general statement of the nature of soil and need for crop rotation, together with a plan for fertilizer trials of potatoes at Benger during the season of 1925.—*P. J. Olson.*

98. [Maksimov, N. A., and A. I. Poĭarkova.] Максимов, Н. А., и А. И. Пояркова. **К вопросу о физиологической природе различий между яровыми и озимьми расами хлебных злаков.** [The physiological nature of winter and spring forms of cereals.] Труды по Прикладной Ботанике и Селекции. [Bull. Appl. Bot. and Plantbreed.] **14**[1]: 211–234. 1925.—The experiments were conducted with 4 varieties of wheat (*lutescens, milturum, erythrospermum, ferrugineum*) and with rye. Along with winter forms, systematically closely related spring forms were sown. The wheat and rye sowings were carried out in greenhouses at different dates. As a result of these experiments, the authors conclude that winter forms require no period of rest for coming into ear, and with early sowing in a greenhouse they are able to continue their development without interruption. A low temperature during the germination of the seed promoted the exit of the ear when the cereal was sown at a late date, while with early sowing it played no part whatever. This leads to the conclusion that a low temperature during germination is not a necessary condition for earing. The temperature at which the winter forms develop also plays a certain part in the process of earing, that is, a high temperature delays the escape of the ear, while at the same time it favors the vegetative growth of the plant. The author holds that an important factor in reaching earing stage is the duration of the period of daylight, which accounts for the influence of the date of sowing on the exit of the ear. As regards the intensity of illumination, some differences between winter and spring forms are observed. Winter forms are more shade-enduring than spring forms and suffer less in a greenhouse from want of light during the winter months; they come into ear under conditions of less intense illumination than spring forms.—*Dorochenko.*

99. [Mal'tsev, A. I.] Мальцев, А. И **Результаты исследования сорнополевой растительности в России за последнее время.** [Results of investigations of field weeds in Russia.] Труды по Прикл. Бот. и Сел. [Bull. Appl. Bot. and Plantbreed.] **13**[3]: 93–105. 1923.—In this paper the details, methods and principles according to which investigations of field weeds should be carried on, are indicated.—*E. Sinskaja.*

100. Mari, Mariano. **La caña Santa Cruz 12/4 en Guayama.** [St. Croix cane 12/4 at Guayama.] Rev. Agric. Puerto Rico **10**[6]: 29–31. *3 fig.* 1923.—A preliminary test of the new St. Croix sugar-cane seedling No. 12/4, carried out at Guayama, Porto Rico, gave very promising results in comparison with the standard varieties, Cristalina and Rayada.—*John A. Stevenson.*

101. May, D. W. **La influencia de la luna. [The influence of the moon.]** Rev. Agric. Puerto Rico 12: 233–236. 1924.—One of the difficulties retarding the development of Porto Rican agriculture is the belief of the people in the influence of the moon on time of planting. In order to combat this superstition plantings of radish, oats and *Crotalaria juncea* were made 3 days before the beginning of each quarter. The results clearly demonstrated that the moon was without influence on plant growth.—*John A. Stevenson.*

102. Menendez Ramos, R. **El "Melinitis minutiflora" y la garrapata. [Melinis minutiflora and the Tick.]** Rev. Agric. Puerto Rico 12: 219–223. *2 fig.* 1924.—Molasses grass (*Melinis minutiflora*) has not proved a satisfactory pasture or forage grass when grown at the Insular Experiment Station in comparison with other grasses. Furthermore, it has failed to have any value in tick control, as claimed by some writers.—*John A. Stevenson.*

103. Menendez Ramos, R. **La caña Hawaii 109. [Hawaiian cane 109.]** Rev. Agric. Puerto Rico 13: 255–263. 1924.—The Hawaiian cane variety No. 109 was introduced into Porto Rico from Cuba by the Insular Experiment Station in 1923 and has attracted very favorable attention. A technical description of the cane is given, together with results of cultural tests in Hawaii.—*John A. Stevenson.*

104. Menendez Ramos, R. **Variedades de caña. [Cane varieties.]** Rev. Agric. Puerto Rico 12: 151–155. 1924.—This is a report on the testing of sugar-cane varieties by the Insular Experiment Station at Rio Piedras, Porto Rico. Particular attention was given to mosaic resistant varieties, including Uba, St. Croix 12/4 and B. H. 10/12. Notes on disease resistance, yield and behavior with respect to environmental conditions were made. Because of greatly varying conditions in Porto Rico the work resolves itself into the finding of cane varieties suited to each locality rather than to one general type that can be grown throughout the Island. Many other seedling canes, both Porto Rican and foreign, were tested.—*John A. Stevenson.*

105. Menendez Ramos, R. **Variedades de caña. [Cane varieties.]** Rev. Agric. Puerto Rico 13: 273–276. 1924.—Notes on field tests of sugar-cane varieties, including B. H. 10/12, St. Croix 12/4 and a series of Porto Rico and P. O. J. seedlings, carried out at the Insular Experiment Station at Rio Piedras, Porto Rico.—*John A. Stevenson.*

106. Miege, Em. **Études Préliminaires sur les blés durs marocains. [Preliminary studies of the hard wheats of Morocco.]** *128 p.* L. Dufay: Paris, 1922.—In the cultivated lands of French Morocco, 2,200,000 ha. are devoted to the cereals and nearly 900,000 ha. to wheat, about 50,000 ha. of which are soft wheat (*Triticum vulgare* Host) and the remainder hard wheat (*T. durum* Desf.). A small number of other species, *T. monococcum* L., *T. dicoccum* Sch., *T. polonicum* L., and *T. sphaerococcum* Perc. are also found in some sections. —Hard wheat, which forms the basis of native culture, is found in all parts of Morocco, but only rarely in the pure state. Usually it is represented by many mixtures of varieties and badly defined sorts, often not named, and making its study particularly difficult. This heterogeneity of cultivated types influences their commercial value, because it does not easily permit of the establishment of standards or constant and well determined botanical forms.— With a view to furnishing a little light on this question, the greatest possible number of specimens of cultivated wheats in all the regions of Morocco were procured. The constituent forms were separated and an attempt was made to purify these mixtures and to cultivate separately and in pedigreed groups all the different forms. The work was continued each year until more than 150 distinct types were developed, which have been studied from the viewpoints of botany, physiology, and agriculture, in comparison with specimens of the same species of diverse origins. The vegetative, morphological, and biometrical characters of each form have been described, and an attempt has then been made to classify them methodically. The workers have been able to unite in a certain number of large groups, corresponding to native names, the most widely spread forms, particularly Zrea, Trikkia, Asker, and Maizza. The 3 first mentioned have white or red heads, and the last mentioned has black or bluish heads. While *T. durum* Desf. is represented in Morocco by very diverse forms, consisting of various mixtures, the 4 great groups are Zrea, Trikkia, Maizza, and Asker. Each of these groups and its forms, can perhaps be easily identified by an examination of its morphological characters, and by its particular agricultural qualities. All of

them are more or less late, with tall rigid stems, susceptible to rust, but with a grain rich and of good quality.—All of the hard wheats of Morocco have been compared with specimens of foreign origin, especially with forms from Algeria and Tunis, and it has been found that the majority are homologous to the North African types. All of the native hard wheats are susceptible to rust. In fact the origin does not appear to have any great influence on the value of these wheats. The specimens of foreign origin studied have not shown themselves to be more resistant to rust or more productive than the best Moroccan types.—*Author (translated).*

107. Miller, E. C. [Rev. of: Jean, F. C., and J. E. Weaver. **Root behavior and crop yield under irrigation.** *v + 66 p. 6 pl., 24 fig.* Carnegie Inst. Washington Publ. 357. 1924 (see Bot. Absts. 14, Entry 1070).] Ecology 6: 183–184. 1925.—A general review, including a short criticism, and ending with the statement that "we need more work of the type of that done by Jean and Weaver in order eventually to place agriculture on a scientific basis."—*T. J. Fitzpatrick.*

108. Moodie, A. W. S. **Biennial Bokhara clover at Tenterfield.** Agric. Gaz. New South Wales 36: 471–481. *1 fig.* 1925.—This crop (*Melilotus alba*) is discussed as a rotation and relative to treatment of seed. The plant does better on the heavier clay soils.—*L. R. Waldron.*

109. Moore, H. C. **Evidence that certified seed is improved seed.** Proc. 11th Ann. Meeting Potato Assoc. America 1924: 26–40. 1924.—Certified seed production increased from 475,300 bushels in 1919 to 7,293,051 bushels in 1924. Results are reported of 11,627 tests of certified seed conducted in 27 states and 8 provinces. Of these, only 2 reported negative or unsatisfactory results with certified seed. A summary of all reports would indicate that on the average, certified seed will outyield the non-certified by approximately 46 bushels per acre.—*Wm. H. Martin.*

110. Mundy, H. G. **Annual report of experiments 1923–1924. Agricultural Experiment Station, Salisbury.** Rhodesia Agric. Jour. 21: 687–707. *8 pl.* 1924.—This report summarizes briefly the results of the more important experiments in progress at this Station in Rhodesia, and the conclusions reached. The investigations fall chiefly under the following heads: Maize rotations; silage crops; leguminous crops for grain and fodder; potatoes; and miscellaneous crops. In connection with the experiments on the inheritance of maize characters the following observations were made. (1) The number of rows on the ear can be controlled within certain limits and a maximum uniformity of 70–80% may be obtained. (2) Roughness or smoothness of the grain can in considerable measure be fixed, though they are to some extent controlled by seasonal conditions and marked departure from type might rapidly result if not controlled by selection. (3) Length of ear is very sensitive to the influence of selection, and is undoubtedly hereditary. (4) Length of envelope or sheath has been proved conclusively to be a hereditary character. The importance of acclimatization of seed maize has been proved by the fact that maize seed grown for many years on the High veld yielded much better than seed from the Low veld.—*L. I. Goldblatt.*

111. Mundy, H. G. **Check-row-planting of maize.** Rhodesia Agric. Jour. 21: 543–549. 1924.—To demonstrate the need for better stands of maize, trial plantings have been carried out at the Salisbury Exp. Sta., in which the yields of 100% stands are compared with perfect plantings from which 10, 15, 25 and 50% of plants were afterwards removed. These tests have clearly shown the very adverse influence which a thinner than optimum stand of plants exerts on the yield.—Experiments at Gwebi Experimental Farm during the last season, gave results which seem to prove that although check-row planting may be advisable in order to control weeds, it does not in itself result in yields heavier than or indeed as heavy as those normally obtained from drilled maize. The number of plants per acre appears to be the deciding factor and if the optimum number is exceeded the yield is just as likely to be reduced as would be the case from poor germination or other causes. Where the land is reasonably clean and in good tilth, there appears no special advantage in check-row planting, provided always that a good stand can be obtained by the ordinary methods. On ill-prepared, and cloddy land, hand planting in check rows should result in a better stand and entail less labor in controlling weeds.—*L. I. Goldblatt.*

112. Neidig, R. E., and R. S. Snyder. **The relation of moisture and available nitrogen to the yield and protein content of wheat.** Soil Sci. **18**: 173–179. 1924.—With an abundance of available N, moisture affects the yield and protein content of wheat, yield being affected most. —*C. G. Deuber.*

113. Nelson, Alexander. **"Hard seeds" and broken seedlings in red clover.** Trans. and Proc. Bot. Soc. Edinburgh **29**[1]: 66–68. 1924.—It is concluded from germination tests that the use of alvasive machinery on large well developed red clover seed gives negative results. The percentage of hard seed is undoubtedly reduced but that of broken seedlings is raised by an equal or even a greater amount, leaving the declarable "germinating percentage" as low as or lower than before. In case of the smaller types of clover seed, machinery does reduce the number of hard seed without increasing the number of broken seedlings. The absolute weight of a sample is some guide to seed merchants as to whether it will be profitable to subject it to an alvasive treatment.—*Thomas Swarbrick.*

114. Nevens, W. B. **The sunflower as a silage crop.** Illinois Agric. Exp. Sta. Bull. 253 *185–225.* 1924.—In comparing 3 dates of harvesting Mammoth Russian sunflowers for silage, the material harvested on the first date, when fed to dairy cows, gave the highest milk flow, and was most palatable and easily digestible. Silage made from the first cutting was somewhat lower in nutrients than that from later cuttings, but the greater palatability of the first cutting more than makes up for the higher percentage of nutrients in the later cuttings. Sunflower silage was lower in dry matter, crude protein, and nitrogen-free extract, but higher in crude fiber, ether extract, and ash than was corn silage.—*H. A. Lunt.*

115. Nicholson, G. **Field experiments with maize. Grafton experiment farm, 1924–1925.** Agric. Gaz. New South Wales **36**: 465–466. 1925.—This experiment deals particularly with time of preparatory plowing as influencing yields. Earlier (April) plowings gave the highest yields.—*L. R. Waldron.*

116. Noll, C. F., and R. D. Lewis. **Soybeans: their culture and uses.** Pennsylvania Agric. Exp. Sta. Bull. 187. *1–15.* 1924.—A summary of soybean investigations to date is presented, together with brief cultural directions and recommendations in regard to varieties. Soybeans are compared with oats in a rotation including wheat, clover and timothy, and corn. The soybean seed was found to produce more protein than the oats, and soybeans when cut for hay produced much more protein and slightly more energy than the oats, grain and straw. When grown with corn for silage, soybeans did not increase the total yield nor appreciably affect the composition of the silage.—*H. W. Thurston, Jr.*

117. Oakley, R. A. **The economics of increased legume production.** Jour. Amer. Soc. Agron. **17**: 373–379. 1925.—European and American agriculture owes much to the introduction of legumes. More acreage and a greater number of varieties are very essential. —*F. M. Schertz.*

118. Ogaard, A. J. **Crop standardization.** Jour. Amer. Soc. Agron. **17**: 73–79. 1925.—The Montana plan recommends pure seed and varieties which have been found to be successful, but the newness of Montana's agriculture and variable conditions in the state make it difficult to operate the plan.—*F. M. Schertz.*

119. Ogaard, A. J. **The utilization of legumes in the rotation.** Jour. Amer. Soc. Agron. **17**: 394–398. 1925.—Legumes stabilize small grain farming at present in the Northern Great Plains (U. S. A.). The place of legumes is very flexible instead of being a part of a rigid rotation plan. Necessity will determine the future use of legumes in this semi-arid region. —*F. M. Schertz.*

120. [Orlov, A. A.] Орлор, А. А. **Географический центр происхождения и район возделыванія твердой пшеницы.—Tr. durum Desf.** [**The geographical center of origin and the area of cultivation of durum wheat Tr. durum Desf.**] (English summary.) Труды по прикл. бот. и селекции. [Bull. Appl. Bot. and Plantbreed.] **13**[1]: 369–459. 1922–1923. [1924.]—This paper is based on a study of literature and the study of 808 samples of durum wheat, 175 of which were obtained from Africa, 404 from Europe, 188 from Asia and 41 from America. Included in this material, collected chiefly by N. I. Vavilov, are samples from such little explored countries as Persia, Turkestan, Bokhara, Abyssinia, etc.—Different characters of durum wheat are described and a key for classification is presented.—Study of geo-

graphical distribution of different varieties revealed that out of 34 known varieties (awnless varieties are not included, being considered as artificially made), 6 of them were found growing in Australia, 9 in America, 20 in Asia, 21 in Europe and all of them were represented in Africa. Out of 74 characters examined, 72 were found on wheats from Algeria, Egypt and Abyssinia, 55 on wheats from Europe and 51 on wheats from Asia. Northern Africa has not only all types of durum wheat found in the rest of the world, but has also many types not found anywhere else. This led to the conclusion that durum wheat originated in Northern Africa.—The 2nd part of the paper deals with distribution of durum wheat, especially in Russia.—An extensive literature list is given, the majority of the papers being Russian.—*M. Demerec.*

121. [Otrygan'ev, A. V.] Отрыганьев, А. В. **Влияние различной степени влажности почвы на урожай и состав табака.** [**Influence of different degrees of soil moisture on the yield and composition of tobacco.**] Издание Института Опытного Табаководства в Краснодаре. [Inst. Exp. Tobacco Growing, Krasnodar.] 22. *1–32.* 1924.—The author has studied the influence of different degrees of moisture in soils of different composition, on the yield of tobacco leaves. On sandy and loamy black earth the optimum moisture for a yield is 60% of the total soil moisture capacity. Within the limits of optimum moisture and total moisture capacity the yields of all investigated soils either remain on the same level or rise inconsiderably. Superabundance of moisture causes a large decrease of yield. The response of the tobacco plant to insufficient moisture is different on different soils. On sandy soils, with low capacity for absorbing water, the plant shows no considerable marks of depression, even with 10% of the total moisture capacity, and yields 40% of the optimum crop; on loamy black earth, tobacco requires 40% of the total moisture capacity in order to produce 50% of the normal crop. With a lower degree of moisture, tobacco suffers badly, produces depressed plants and even perishes. All experiments with varying moisture have shown that a deficiency of moisture in the 2nd stage of development (after flowering) causes a lower yield of leaves than the same deficiency in the period before flowering. On light soils the nitrogen and nicotine contents are in direct proportion to the fertilizers contained in the soil and independent of the amount of soil moisture. The carbohydrate content of the plant is in inverse proportion to nicotine and nitrogen. On loamy black earth and gray, loamy, wood soil the nitrogen and nicotine contents are directly dependent on the quantity of fertilizers and inversely dependent on the moisture conditions. The carbohydrate content of the leaves is in inverse proportion to the nitrogen content, but only to a certain limit. —*Dorochenko.*

122. Packer, E. H. **Cassava cultivation in Papua [Mercury].** Australian Sugar Jour. **17:** 179. 1925.—This article describes the culture of cassava, including preparation of land, handling and planting of cuttings, yield, harvesting under wet and dry conditions and methods of cooking practised by natives and whites.—Although practically every insect pest known to the tropics is found in Rabaul, none molest cassava; it is planted as a protection to sweet potatoes, as neither grubs nor beetles pass through it.—*Nellie E. Fealey.*

123. [Panchenko, M. E.] Панченко М. Е. **Культура риса в Приморской области.** [**The evolution of rice culture in the Far East, Asiatic Russia.**] Труды по Прикладной Ботанике и Селекции. [Bull. Appl. Bot. and Plantbreed.] **14**[1]: 140–164. 1925.—Rice appears to have been cultivated by the Chinese in this region from ancient time but after the occupation of the country by the Russians (1861–1865 to 1917) there are no records whatever about the culture of rice.—The new beginnings of rice cultivation are referred to 1918. During the last 6 years (1918 to 1923) the rice culture has spread from the frontier of Korea to the Little Khingan (42½°–48½° north latitude).—In the presence of well-timed sowing and proper cultivation no poor harvests were observed during the above mentioned period.—The variety (*erythroceros* Körn.) established in the country is adapted to the local climatic and soil conditions, ending its vegetation period in 125–130 days. The varieties met with as admixtures (*vulgaris, brunnea* and *italica*) show a longer vegetation period.—The abundance of soils suited to rice culture, comparatively high yields, favorable climatic conditions, rich supply of irrigation waters, etc., have all encouraged the rapid spread of rice culture.—*E. Barulina.*

124. Parker, Edward C. **United States grades for timothy hay, clover hay, clover mixed hay, and grass mixed hay.** U. S. Dept. Agric. Dept. Circ. 326. *1–24.* 1924.

125. Percival, John. **The wheat plant: A monograph: Parts I and II.** *463 p. 288 fig.* Duckworth & Co. London, 1921.—This monograph is the embodiment of more than 20 years' research on the wheat plant. In Part I is given a detailed description, accompanied by abundant new illustrations, of the morphology, anatomy and development of the plant. The introductory chapter deals with the distribution, both in space and time, of the cultivation of this cereal. In the next 2 chapters the grain and its germination are fully described, while the following 3 chapters are devoted to the morphology, anatomy, and development of the roots, leaves and stems. The "tillering," "lodging" and "shooting" of the stems and escape of the ear from the leaf sheaths are fully discussed. In the remaining 2 chapters of Part I the development and structure of the inflorescence and flower are described; this is followed by a detailed account of anthesis, pollination and fertilisation, concluding with a description of the development of the grain.—The greater portion of Part II deals with the classification, characteristics and relationships of the wild species of wheat and the races and varieties of the cultivated forms. This section of the work is based upon a prolonged study of nearly 2000 forms of wheat which are grown annually by the author at the farm of University College, Reading. This vast number of wheats, which probably form the most representative collection in existence, has been obtained from almost all the wheat growing regions of the world. In the opening chapter the classification of wheat is disdussed and the author concludes that in addition to the 2 wild species of wheat, *Triticum aegilopoides* Bal. and *Triticum dicoccoides* Korn., the cultivated wheats fall into 11 races, namely, *T. monococcum* L., *T. dicoccum* Schubl., *T. orientale* mihi, *T. durum* Desf., *T. polonicum* L., *T. turgidum* L., *T. pyramidale* mihi, *T. vulgare* Host, *T. compactum* Host, *T. sphaerococcum* mihi, and *T. spelta* L. To each species and race a separate chapter is devoted, and the varieties and forms of each species and race are fully described. These chapters are profusely illustrated with photographs of the chief forms of the several varieties. This systematic portion of the work is followed by a chapter on the origin and relationships of the races of wheat. The author's conclusions on the origin of the bread wheats—*Triticum vulgare*—are important. From his study of the morphology of the wild and cultivated wheats he is led to the conclusion that "there is not, nor has there ever been a prototype of the bread wheats," and he believes that "the characters of *T. vulgare* and its allies appear . . . . to be those of a vast hybrid race, initiated long ago by the crossing of wheats of the Emmer series with species of Aegilops." The next chapter deals with the variation of the wheat plant and this is followed by chapters on hybridisation, improvement and breeding of wheat. Part II concludes with a chapter on the yields. The acre yield in different parts of the world is given and its dependence upon soil and climatic conditions as well as upon the amount of seed sown, the time and methods of sowing, the size of grain, and various other factors, is critically discussed. A list of wheats and an extensive bibliography are included.—*A. G. Erith.*

126. [Pisarev, V. E.] Писарев, В. Е. **Скороспелые пшеницы Восточной Сибири. [Early wheats of Eastern Siberia.]** Труды по Прикл. Бот. и Селекц. [Bull.Appl. Bot. and Plant Breed.] **14**[1]: 112–135. 1925.—Extremely early forms of spring wheat have been found in Eastern Siberia. The prevailing botanical variety among those wheats is *Triticum vulgare* var. *ferrugineum sibiricum* Flaksb. Besides this principal form, the author has discovered perfectly corresponding forms such as vars. *erythrospermum*, *lutescens* and *milturum*. —The heat requirements of these varieties are reduced to average diurnal temperatures of 1300–1400°C. for the whole vegetation period, which admits of their cultivation at the most extreme limits of agriculture. Notwithstanding their short stems and small grain, these wheats are good yielders and, owing to their earliness as well as to their rich returns, prove interesting and valuable material. The author points out that for the purpose of obtaining earlier northern forms of spring wheat, those from Eastern Siberia will prove an excellent material for hybridisation.—*E. Barulina.*

127. Pridham, J. T. **New varieties of wheat, oats, and barley.** Agric. Gaz. New South Wales **36**: 417–420. 1925.—In addition to pointing out the necessity of plant breeding with the cereal grains, certain of the results secured in Australia from breeding are briefly indicated. An illustration of the value of an introduction is given by the barley variety Trabut,

introduced from Algeria, which has become a successful variety in New South Wales.—*L. R. Waldron.*

128. Pullen, A. R. **The supply of cotton seed for planting purposes.** Jour. Dept. Agric. Union of South Africa **9**: 318–323. 1924.—The requirements of good seed, trueness to type, importance of growing only one variety of cotton in a locality or even in a wide area, and the means by which this might be obtained are discussed. A coöperative system of seed multiplication, distribution, registration, etc., to ensure the distribution of the correct type of seed, is outlined. The benefits to be derived from one variety cotton areas are summarized as follows: (1) No mixing of varieties through crossing in the field; (2) the danger of mixing seed at the gin minimized; (3) the mixing of lints of different lengths, quality and character in the same bale would be reduced; (4) the bales of cotton produced would be more nearly of the same grade and thus receive more favorable recognition; (5) by employing scientific methods of selection and production the chances of procuring improved seed would be enhanced; (6) good seed would be less liable to deteriorate than in a "mixed variety area." Until some efficient system of seed control and seed distribution has been worked out for South African growers, those farmers who cannot get pure seed are advised to make the best of their own seed by mass selection.—*L. 1. Goldblatt.*

129. [Pushkarev, N. I.] Пушкарев, Н. И. **Замечательный пример отбора природными условиями ложно-озимой конопли.** [**A remarkable case of selection of a pseudo-winter hemp by natural conditions.**] *23 p. 6 fig.* Rostov [Don], 1924.—By sowing a cultivated spring variety of hemp in fall, and by repeating the experiment with the seed gathered from the plants withstanding the winter, a pseudo-winter hemp was obtained. The latter was successfully sown in fall, while the sowings obtained from seed of the common spring hemp were almost entirely killed. Pseudo-hemp occupies an intermediate position between cultivated hemp (*Cannabis sativa*) and weed hemp (*Cannabis ruderalis*).—*E. Sinskaja.*

130. Richey, Frederick D. **Corn judging and the productiveness of corn.** Jour. Amer. Soc. Agron. **17**: 313–318. 1925.—Experimental data seem to warrant the recommendation to select longer, heavier ears with proportionately heavy cobs and with relatively few rows of wide thick kernels as a means of obtaining a supply of seed corn for general planting. Attempts to judge the relative productiveness of samples of reasonably good ears on the basis of their appearance are not warranted. The assumption that a winning sample is genetically more productive than a losing one is frequently misleading and may be harmful.—*F. M. Schertz.*

131. Richey, Frederick D. **Handling the soft-corn crop.** U. S. Dept. Agric. Dept. Circ. 333. *1–8. Pl. 1–2.* 1924.—A discussion of what constitutes soft corn, frosted corn, feeding soft corn, the silo, cutting and shocking corn, cribbing soft corn, and the crop as a whole. —*L. R. Hesler.*

132. Rivera, Eugenio M. **Informe preliminar sobre algunas variedades de caña en la isla de Cuba.** [**Preliminary report on certain cane varieties in Cuba.**] Rev. Agric. Puerto Rico **13**: 227–235. *8 fig.* 1924.—A report on the behavior, under Cuban conditions, of a large number of Cane varieties imported from Porto Rico.—*John A. Stevenson.*

133. Riviere, Gustave, et Georges Pichard. **Essais comparatifs entre l'efficacité de l'azote nitrique, employé seul sur les récoltes, et l'azote ammoniacal en présence de stérilisants partiels du sol.** [**A comparison of the values of nitric and ammoniacal nitrogen in the presence of sterile soil.**] Compt. Rend. Acad. Sci. Paris **180**: 1054–1056. 1925.—A comparison of the effect of sodium nitrate and ammonium sulphate is made. The sodium nitrate gave the larger yield whether used alone or with sodium arsenate.—*C. H. Farr.*

134. Rosa, J. T. **Sweet potato production in California.** California Agric. Exp. Sta. Circ. 285. *1–29.* 1925.—Consideration is given to the cultural, harvesting and storage practices in sweet potato production. A disease control program is outlined by which losses caused by the common diseases may be minimized.—*A. R. C. Haas.*

135. Rosenfeld, Arthur H. **"Luz y aire" en el cultivo moderno de la caña de azúcar.** [**Light and air in modern sugar cane cultivation.**] Rev. Agric. Puerto Rico **13**: 237–247. 1924. —The old theory that distance planting was necessary or desirable in order to give light and air to the plants has recently been revived. The author reviews experimental work carried

on in Argentina, Hawaii, Porto Rico and elsewhere along this line and concludes that cane should be planted as close as is consistent with adequate cultivation with modern implements. This distance is about 5 feet for standard varieties such as B208, B. H. 10/12, etc., and 5½ to 6 feet for such varieties as the P. O. J. seedlings.—*John A. Stevenson.*

136. Rudall, H. **Farmers' field trials.** Jour. Dept. Agric. Western Australia 2nd Ser. **2:** 117–120. *2 fig.* 1925.—Experiments were carried out involving comparison of wheat varieties; rate of seeding; rate of super application; and fertilizer trials. In the variety trials, Merredin ranked first, followed in the order named by Gluyas Early, Florence, and S. H. J. Rate of seeding trials in which 45, 60 and 90 pounds were compared, favored the 60-pound rate. In the rate of super trials, 150 pounds per acre were found to give better results than either 75 or 225 pounds. In the fertilizer trials super alone was compared with super and ammonia, super and potash, and super ammonia and potash. The trial was carried on at 2 places, Gutha and Carnamah. At Gutha the highest yields were obtained where super and ammonia were applied. At Carnamah super alone gave the best results.—*P. J. Olson.*

137. Rudkin, S., and A. W. S. Moodie. **Sudan grass at Nyngan Experiment Farm.** Agric. Gaz. New South Wales **36:** 471–472. *2 fig.* 1925.—Sudan grass at this point showed successful results. There is little danger of poisoning providing pure seed is obtained.—*L. R. Waldron.*

138. Ruprecht, R. W. **Report of the Chemist.** Florida Agric. Exp. Sta. **1924:** 47R–55R. 1924.—(1) Dieback of citrus. The ammoniation was general through a certain grove and could not be correlated with any particular fertilizer treatment. In an attempt to cause dieback 3 trees were given a double dose of ammonia in June 1923. None showed any sign of dieback, trees were not more ammoniated than the others. (2) As to nutrition studies an attempt is being made to determine the optimum amount of fertilizer for pecans and an experiment on the effect of high versus low potash fertilizers was continued. (3) Seed of *Aleurites molluccana* had a much thicker shell than those of the tung-oil tree, *A. fordi.* The percentage of oil in the whole nut is almost twice as great in *A. fordi.* It also "dries" more rapidly. Extraction by ether gives a higher percentage of oil than by crushing the seed.—*J. C. Th. Uphof.*

139. Saldaña, José A. **Comparación de la caña Java desconocida con la variedad Uba. [Comparison of an unknown Javan cane with Uba.]** Rev. Agric. Puerto Rico **13:** 13–14. 1924.—An unknown seedling cane variety of Javan origin was grown experimentally in comparison with Uba, a variety grown very extensively because of its resistance to mosaic. The Javan cane gave a higher yield than the Uba.—*John A. Stevenson.*

140. Scherffius, W. H., and J. du P. Oosthuizen. **Cotton in South Africa.** South African Agricultural Series 3. *207 p.* Johannesburg Central News Agency Ltd., 1924.—An illustrated handbook of cotton production, including an account of the development of cotton culture in South Africa, the varieties and cultural methods used, the ginning and marketing of cotton, cotton-seed products, insect pests and diseases, temperature and rainfall conditions. Production has increased gradually from 27 bales in 1910–1911 to 5,218 bales in 1922–1923, and it is believed that "cotton is destined to be one of the principal agricultural crops of this country." The data from South Africa are supplemented by a judicious selection of material from other regions. The principal types and varieties of cotton are reviewed, including many of American origin. The Pima variety of Egyptian cotton, developed and grown commercially in Arizona, is considered well adapted to irrigated conditions in South Africa.—*O. F. Cook.*

141. Schilling, Ernst. **Die Faserstoffe des Pflanzenreichs. [The fiber materials of the vegetable kingdom.]** *320 p.* Bücherei der Faserforschung: Leipzig, 1924.—The subtitle of this book indicates its contents: "For woven fabrics, threads, cordage, basketry, paper stock, tying materials, brush and mattress material, with their names, origin, marketing and literature." Following a brief introduction is a general statement on the fiber industry, and the classification of plant fibers, first according to uses and then according to their botanical origin, with a discussion of the names of plants and fibers. Then follows in alphabetical order a catalog of 1926 species, with botanical synonyms and common names and brief statements

regarding family, habitat, geographic distribution, kind of fiber produced, principal uses and citations to literature. The general catalog is followed by shorter lists referring only to the genera of plants under their principal uses, and afterward by plant families. A bibliography of 460 works on fibers and fiber plants completes this very compact book of condensed information about plant fibers.—*Lyster H. Dewey.*

142. Schonland, S. **The jointed cactus.** Jour. Dept. Agric. Union South Africa **9**: 216–225. *3 pl.* 1924.—A description is given of *Opuntia aurantiaca.* There are at present about 14,000 morgen of commonage and about 35,000 morgen on farms, chiefly in the Eastern Cape Province of South Africa, infested by this noxious weed.—The plant is very brittle and joints break off by a slight touch. By means of innumerable spines which cling to clothing and boots, fur of animals, etc., these joints are easily carried long distances and propagation is thus affected.—Eradication consists chiefly in uprooting the plants, spraying with poison and burning when dry. The estimated costs of eradication which have been repeatedly published are probably grossly exaggerated. The need of clearing commonages and native locations, and the necessity for government intervention with financial assistance, etc., is strongly emphasized.—*L. I. Goldblatt.*

143. Schoth, H. A., and G. R. Hyslop. **Common vetch.** Oregon Agric. Exp. Sta. Bull. 213. *1–29.* 1925.—This vetch is grown mainly in western Oregon, Washington and California. In Oregon it is the chief annual leguminous forage crop. The acreage in Oregon varies from 15,000 to 45,000 acres a year. The value runs from $400,000 to $500,000 per year for the hay crop and the seed crop is valued at $125,000 to $153,000 a year. Its other uses include, pasture, silage, soiling, cover crop and honey production. A moist, cool climate free from extremes is best suited for this crop. Medium to heavy, well drained soils are best. Inoculation is usually not necessary for common vetch except on extremely acid soils. Early fall seeding is recommended. Sixty to eighty pounds per acre is a good rate of seeding. Forty pounds of gray winter oats may be added to the vetch seed. Mixtures of vetch and grain are usually preferred for hay. Vetch hay should be cut when the lower pods are $\frac{2}{3}$ filled. For silage, it should be cut before the seed have hardened. When harvested for seed, timely cutting is necessary to avoid shattering. Vetch should be rotated with corn, potatoes or cereals. Light applications of land-plaster have been of some benefit. Applications of lime were of little value except in very acid soils. Diseases and pests are few, aphids and stem-rot probably being the worst.—*C. E. Owens.*

144. Sievers, F. J. **Outstanding weaknesses in investigational work in agronomy.** (Abstract.) Jour. Amer. Soc. Agron. **17**: 88–89. 1925.

145. [Sinskaĭa, E. N.] Синская, Е. Н. **О по левых культурах Алтая. [Field crops of Altai.]** Трулы по Прикл. Бот. и Селекции. [Bull. Appl. Bot. and Plantbreed.] **14**[1]: 359–376. 1925.—The principal crop of the Southern Altai is soft wheat which in the mountains reaches altitudes of up to 1200–1400 m. In the upper zone, above 900 m. the varieties *ferrugineum* Al. and *milturum* Al. prevail. In the lower zone, below 600 m., the varieties *ferrugineum*, *milturum*, *lutescens* and *erythrospermum* are widely spread. The variety *fuliginosum* is met with only in the upper zone, as an admixture.—Oats reach the same altitudes as wheat. Among weed oats (*Avena sativa* L.) there are easily shattering forms.—Only 1 variety of barley is sown: var. *pallidum* Ser.—Millet may occur up to 1100m. Of the oleiferous and fiber plants, flax and hemp are sown. Hemp grows in the wild state and is widely spread in the Altai. The population utilizes weed hemp to a large extent for fiber and the seed of weed hemp are gathered and sown. Thus the evolution from a weed to a cultivated plant may be observed in Altai at the present time in all its stages.—*E. Barulina.*

146. Smith, Bradford B. **Relation between weather conditions and yield of cotton in Louisiana.** Jour. Agric. Res. **30**: 1083–1086. *1 fig.* 1925.—This study was undertaken to discover to what degree the variations in yield of cotton in Louisiana from 1900 to 1922 could be explained on the basis of available weather data for the State. Of the 4 major influences affecting yield—inherent capacity of the plant itself to bear; fertility of the soil; weather and length of growing season; and cultural practices—only the weather is important in explaining year-to-year variations when an area as large as a state is considered; variations in the other influences within the state tend to compensate each other. Accordingly, the statistical relation

of average rainfall and temperature in June and August and average rainfall in July to the final yield of cotton was determined by a new method of simultaneous approximation. The net relation of each of the cited weather factors to yield is graphically shown. To test the truth of these net relations they were employed to make etimates of yield based solely upon them for the years included in the period, and these estimates were compared with the actual yields. The agreement of the 2 was exceptional, the correlation being 0.97. This would indicate that by the end of August it would be possible to estimate with a high degree of accuracy what the final yield of cotton would be.—*Author.*

147. Stening, H. C. **Experiments with cereal crops. Temora Experiment Farm, 1924.** Agric. Gaz. New South Wales **36**: 391–392. 1925.—Yields are presented from the following experiments: Wheat variety trial, fertilizer trial, rate of seeding, prevention of bunt, cultivation experiments, wheat for hay, and oat varieties. The new wheat variety, Waratah, gave the maximum yield of over 43 bushels per acre in comparison with 32 bushels from Hard Federation.—*L. R. Waldron.*

148. Stokes, W. E. **Report of grass and forage crops specialist.** Florida Agric. Exp. Sta. Ann. Rept. 1924: 25R–46R. 1924.—A test of methods of seeding pasture grasses has been started near Gainesville on flatwood wire grass land of the Porthmouth series. The plots will be kept grazed instead of mowed. Napier grass will furnish abundant grazing, if not grazed cautiously; continuously grazed plots were completely killed in 6 months. This grass apparently pays when well cultivated. Irrigated and non-irrigated Japanese cane produced 34.97 and 21.78 tons respectively; Napier grass 42.43 and 21.62 tons. Twenty-two varieties of sorghum were tested, and confirm last year's test, that late-maturing varieties give the heaviest yields. On Norfolk sandy soil good varieties of sorghum will outyield corn. Honey sorghum was the highest yielder. Grain sorghums made a good crop of grain, but were damaged from the high humidity. Shallu seemed best for Florida. Sunflowers do not yield enough as a silage crop. For peanut tests no fertilizers were used, but during blooming ½ of each plot was treated with land plaster at 600 pounds per acre. Details of the results are given. Peanuts were selected as to high yielding qualities, 20 high yielding selections had been planted. Peanuts have been grown in rotation with corn and velvet beans for 6 years. Other rotation experiments are recorded. Oats seed were selected to obtain rust resistant strains. Kudzu on Norfolk sandy loam has not made enough growth to warrant either cutting for hay or pasturing. Most of the winter legumes tested failed on Norfolk sands; Tifton bur clover (*Medicago rigidula*) everywhere made a satisfactory growth. On the Porthmouth soil series Hubam clover, bur clover, Tifton clover and subterranean clover (*Trifolium subterraneum*) made satisfactory growth. A number of pasture grasses were studied. Vasey grass (*Paspalum larranagai*) made excellent growth on low land and was eagerly eaten by cattle. *Panicum repens* made excellent sod and is closely grazed by cattle. It is a promising grass for Florida, but has underground runners. Many lawn grasses were tried. Good stands were obtained of carpet grass (*Axonopus compressus*) and Bahia grass (*Paspalum notatum*) from May, June and July plantings.—*J. C. Th. Uphof.*

149. Stuart, W. **Potato observations abroad.** Proc. Eleventh Ann. Meeting Potato Assoc. Amer. **1924**: 123–129. 1925.—A report of the author's attendance at a potato conference held under the joint auspices of the Board of Agriculture for Scotland, with potato dealers and growers at Edinburg, August 20 and 21, 1924, and of his observations of potato production and potato experimental work in the British Isles, Holland and France.—In reporting on the Conference, the author reviews much of the discussion which related to the work of the Board on seed improvement, seed certification, the registration of varieties, and immunity to the wart disease. For registration, specially chosen tuber samples must be submitted for testing, at the Station at East Craigs and Phillipstorm, as to plant and tuber characteristics, productivity and immunity to the wart disease. A discussion of methods of conducting yield tests showed that a single test resulted in a probable error of 10%, 4 replications a probable error of 5%, 9 replications a probable error of 3⅓%, and 25 repetitions a probable error of 2%. Facilities for the training of young men as inspectors for the Seed Certification Inspection Service are offered by the Board of Agriculture at the East Craigs Station. Requirements and methods for the completion of this training course are detailed by the author.—The author expresses

much concern over the very general occurrence of late blight in the British Isles, Holland and France and the apparent lack of appreciation by growers of the necessity for its control by spraying. The comparatively large yields obtained in Britain are largely the result of favorable climate, large amounts of seed planted, close spacing of plants, fertile soil, and long rotations. Methods and equipment for harvesting and marketing are related. Poor and inadequate storage facilities resulting in a storage shrinkage averaging approximately 25% have resulted in a recently increased investigation of the storage problem from the economic standpoint. Major attention to the study of methods for control of wart is being given by the pathologists in each of these European countries. Studies at the Rothamsted Station have shown that control by grafting onto immune stocks is ineffective. Work at the State Institute for Phytopathology at Wageningen, Holland, is concerned mainly with the study of such diseases as late blight, curl disease, and stipple streak. Studies in the classification of varieties, origin of varieties by mutation, and modes of transmission of virus and degeneration diseases being made at several experiment stations in France, are also reviewed.—*E. V. Hardenburg.*

150. Stubbe, J. D. **Abono del tabaco y preparación de semilleros en Puerto Rico. [Fertilization of tobacco and preparation of seed beds in Porto Rico.]** Rev. Agric. Puerto Rico **12**[1]: 19–22. 1924.—The author discusses the proper fertilizer formulas to be used under Porto Rican conditions and outlines methods of handling tobacco seed beds.—*John A. Stevenson.*

151. Summerby, R. **A study of sizes of plats, numbers of replications and the frequency and methods of using check plats, in relation to accuracy in field experiments.** Jour. Amer. Soc. Agron. **17**: 140–150. 1925.—Small plats were more accurate than large plats. There is a steady and rapid increase in accuracy as the number of replications is increased. There was no consistency as regards the effect of more or less frequent checks no matter what system of checking was used.—*F. M. Schertz.*

152. [Sutulov, A. N.] Сутулов, А. Н. **Льняное семя. [Linseed.]** *164 p. 23 fig.* Moscow, 1923.—This paper is part of a monograph on linseed planned by the author. The first 2 parts treat of the processes of ripening and germinating, the 3rd of weed admixtures.—*E. Sinskaja.*

153. Taylor, H. W. **Tobacco culture with special reference to South African conditions.** *176 p. 50 pl.* Central News Agency, Ltd.: South Africa, 1924.—The first 3 chapters deal with the botany and history of tobacco, the world distribution of culture and international trade, and the commercial producing districts of South Africa. Seed selection and seed-beds are discussed in chapters 4 and 5. Separate chapters are devoted to culture of bright or flue-cured tobacco, dark tobacco (air-cured, sun-cured, fire-cured), Turkish tobacco and cigar tobacco. Insect pests and plant diseases are treated separately and the final chapter covers marketing. "In preparing this volume the object has been to present the main facts relating to tobacco culture in South Africa, although valuable data from other countries have been included."—*W. W. Garner.*

154. [Ternovskii, M.] Терновский, М. **Цшеницы Ставрополвской губ. [Wheat of the government of Stavropol.]** (English summary.) Труды по прикл. Бот. и селекции (Bull. Appl. Bot. and Plantbreed.] **13**[1]: 485–508. 1922–1923. [1923].—The author collected samples of winter and spring wheats throughout the government of Stavropol; these samples were then planted at the Experiment Station and a study of their composition was made. This paper gives a detailed list of varieties found. Among winter wheats *T. vulgare* var. *erythrospermum* Körn. greatly prevailed, var. *ferrugineum* Al. being next. Among spring wheats, *T. durum* var. *hordeiforme* Host had first place, followed by *T. vulgare* var. *lutescens* Al., and by *T. durum* vars. *Reichenbachi* Körn. and *coerulescens* Bayle.—*M. Demerec.*

155. Thomas, I. **Field experiments at the Chapman Experiment Farm, 1924.** Jour. Dept. Agric. Western Australia 2nd. Ser. **2**: 129–132. *1 fig.* 1925.—As regards rate of seeding, "two years experience indicate that with a late free stooling variety, there is no advantage in using more than 45 pounds of wheat seed either for grain or hay. With an earlier sparse stooling variety, however, heavier seeding is desirable for hay purposes."—Three rates of superphosphate application were tried, namely, 75, 150, and 225 pounds Yields of both grain and hay were increased by the larger amounts of fertilizer. Wheat was the crop grown.—An

experiment comparing middle May, June, and July seedings was laid down. Although a fire destroyed the crop, a photograph taken before the fire indicates a progressive decrease in yield from early to late sowings.—*P. J. Olson.*

156. Torres, I. L. **Nuevo uso de la yerba elefante.** [**A new use for elephant grass.**] Rev. Agric. Puerto Rico **14**: 208–209. 1925.—Elephant grass has been found to provide not only thatching material for tobacco curing barns but also poles for suspensions of the harvested leaves during the curing period.—*John A. Stevenson.*

157. Towle, R. S. **Work of the Sheridan Field Station for the seven years from 1917 to 1923, inclusive.** U. S. Dept. Agric. Dept. Bull. 1306. *1–29.* 1925.—This bulletin includes results of experiments with crop rotations and tillage methods, variety and planting tests of cereals, forage crops, and potatoes, and shelterbelt investigations conducted cooperatively at the Sheridan Field Station, Wyoming, during the period, 1917–1923. Climatic records and the seasonal variation in yields show the seasonal rainfall to be the chief controlling factor in crop production over this area. The average differences in yield of crops on fall plowing from those on spring plowing are not significant if the spring plowing does not unduly delay seeding. Yields of small grain on corn ground were slightly greater than on land in small grain the previous year. Yields of spring grain on corn land averaged only slightly lower than on fallow. Yields of small grain on fallow plowed at different times after stable and green manure are given, as are also yields of oats, corn, sorgo, alfalfa, millet, Sudan grass and field peas. Norway poplar, box elder, Chinese and American elm and green ash were tested for shelterbelt purposes.—*Author.*

158. Townsend, C. O. **Sugar-beet growing under irrigation.** U. S. Dept. Agric. Farmers Bull. 567. *1–32. Illus.* 1924.—This bulletin treats of all operations in sugar-beet growing under irrigation from the selection of the soil to the disposition of the by-products, including a brief discussion of drainage, crop rotation, and livestock in relation to the beet crop.—*Author.*

159. [Uklonskaĭa, M.] Уклонская, М. **К вопросу изучения сортов риса Туркестана.** [**A contribution to the investigation of the rice varieties of Turkestan.**] Труды по Прикл. Бот. и Селекции. [Bull. Appl. Bot. and Plantbreed.] **14**[1]: 165–176. 1925.—The author gives a description of the varieties of rice and their botanical composition, as well as the results obtained by testing their economic qualities and the biological peculiarities of rice varieties in Central Asia. The most widely spread in Turkestan is the variety *vulgaris* Körn., then follow the varieties *erythroceros* Körn. and *caucasica* Bat. The varieties *ianthoceros* Körn., *melanoceros* Körn., *polycarpa* Al., *Deswauxii* Körn., *rubra* Körn., *italica* Al., and *Sundensis* Körn. occur less frequently.—*E. Barulina.*

160. [Vavilov, N. I.] Вавилов, Н. И. **К познанию мягких пшениц.** [**A contribution to the classification of soft wheats—Triticum vulgare Vill.**] Труды по Прикл Бот. и Селекции. [Bull. Appl. Bot. and Plantbreed.] **13**[1]: 149–257. 1922–1923. [1923].—The author studied extensively the varieties of *T. vulgare*, especially those growing in European Russia and Western Asia. As a result he points out the inadequacy of present day classifications and presents a new key which includes new forms found by him. In that key 3 new groups not found in other classifications are added, namely, half-bearded group, corresponding to short awned group in barley; inflatum group, corresponding to trufurcatum of barley; and liguleless group. Varieties representative of those groups were found growing mostly in Persia, Bokhara, India, Mongolia, China or Afganistan.—The usefulness of different characters in classification is discussed and a list of these characters arranged in their order of usefulness is given.—A study of geographical diversity of *T. vulgare* was made, and it was found that Persia, Afganistan, India, Turkestan and Mongolia have a larger number of different varieties than any other part of the world. The conclusion is made that the probable origin of *T. vulgare* is South-Western Asia.—A very detailed English summary is given.—*M. Demerec.*

161. [Vavilov, N. I.] Вавилов, Н. И. **Полевые культуры Юго-Востока.** [**Field crops of southeastern European Russia.**] Приложение 23 Труды по Прикл. Бот. и Селекции. [Bull. Appl. Bot. and Plantbreed.] **13**: (Suppl. 23): 1–228. *Illus., maps.* 1922.—Besides a review of the literature, the work is founded on the results of 3 years' observations of the numerous plant varieties cultivated on the experimental grounds at Saratov, as well as on direct observations during the author's journeys throughout the district. The author gives his chief

attention to the varietal composition of the field flora, comparatively disregarding the problems of agricultural technique. Besides data concerning the botanical and varietal composition of the cultivated flora, historical information is given and the following problems are discussed: Breeding of given crops, and their origin, general geography, genetics and physiology. All data are founded chiefly on the author's own work. The question of the cultivation of Cucurbitaceae on a field scale in southeastern European Russia is elaborated with special care.—*E. Sinskaja.*

162. Vélez, Ramón. **Resultados obtenidos en la siembra di variedades de arroz. [Varietal tests of rice.]** Rev. Agric. Puerto Rico **14**: 158–164. 1925.—A variety of rice known as "Honduras" was grown on 15 demonstration plots in various parts of the Island. Native varieties were grown as checks. In all cases Honduras gave increased yields of 100–500 pounds per cuerda over the native types.—*John A. Stevenson.*

163. Vidal Colon, J. M. **Resultados de una siembra de algodon "sea island." Results of a planting of Sea-Island cotton.** Rev. Agric. Puerto Rico **14**: 325–330. *3 fig.* 1925.—An experimental planting of Sea Island Cotton covering 50 cuerdas, was made in the semi-arid region of the south coast of Porto Rico. In spite of insect attacks, an excellent yield averaging nearly 1000 pounds per cuerda was obtained.—*John A. Stevenson.*

164. Vinall, H. N., R. E. Getty, and A. B. Cron. **Sorghum experiments on the Great Plains.** U. S. Dept. Agric. Dept. Bull. 1260. *1–88. Fig. 1–24.* 1924.—A brief discussion is given of the climatic features, soils and native vegetation of the Great Plains (U. S. A.), the relationship of the different groups of sorghum varieties, and the experimental methods used. The growing season, height of plants and yield per acre of air-dry forage and of threshed seed are given for all the principal varieties at Hays, Kansas, Chillicothe and Amarillo, Texas, over the period 1914 to 1921, inclusive. The yields alone are given for Woodward and Lawton, Oklahoma, Dalhart and Big Spring, Texas, and Tucumcari, New Mexico, over somewhat shorter periods. The results indicate that the sorgos (sweet sorghums) were superior to the grain sorghums in the production of hay, fodder, and silage. None of the sorghums were reliable grain producers in the northern part of the Great Plains. The best varieties of sorgo for the northern central, and southern sections are given, as well as the best grain sorghums when both grain and forage are desired. Cultural methods, including the date and rate of seeding, spacing of rows and of plants in the row and a comparison of field and laboratory germination were studied and results are reported.—*H. N. Vinall.*

165. Viswanath, B., and S. Kashinath Ayyar. **Some factors that determine the ripeness of sugarcane.** Mem. Dept. Agric. India Chem. Ser. **7**: 123–144. *Fig. 1–4.* 1924.—In general, as a cane ripens the various internodes show a levelling tendency in the matter of their total solid contents. The purity alone is not always a reliable criterion for judging the maturity of a cane crop. In testing the stage of maturity of a cane, the ratio of top brix to bottom brix is quite helpful and accurate.—*J. Sen.*

166. Walters, J. A. T. **The Carob bean (Ceratonia siliqua) in Rhodesia, and other indigenous trees of value for stock feed.** Rhodesia Agric. Jour. **21**: 567–572. *Pl. 1–4.* 1924. 1924.—The pods of a number of the native leguminous trees are greedily eaten by stock, more especially by native cattle, and by the various kinds of antelope, wild pig, etc., which have access to them. These pods are both palatable and highly nutritive being like most other leguminous foodstuffs, relatively rich in protein. Analyses are given of the pods of the Carob bean (*Ceratonia siliqua*) which is the most successful of the introduced leguminous trees and which has been found to thrive and fruit satisfactorily in Rhodesia. The chief of the indigenous trees which bear pods are Acacia trees, Bauhinia trees, and *Swartzia Madagascariensis*. Analyses are given of the pods, which are compared with those of some of the best known cattle feeds. These figures show that the food value of the pods is beyond question, particularly when taken in conjunction with the ease with which they can be collected, stored and ground. The introduced Carob bean, however, seems to possess 2 great advantages over the native trees, namely, the ease with which it can be propagated and the earliness of its bearing.—*L. I. Goldblatt.*

167. Watkins, W. R. **Farmers' experiment plots. Potato experiments, 1924.** Agric. Gaz. New South Wales **36**: 421–422. 1925.—These trials were conducted upon 3 private farms with 5 varieties. The maximum yield was secured from the variety, Factor.—*L. R. Waldron.*

168. Wenholz, H. **Tenterfield field maize competition.** Agric. Gaz. New South Wales 36: 457–464. *2 fig.* 1925.—These field competitions were carried on in a manner similar to those for wheat in New South Wales. Six farmers competed. Notes were taken on germination or stand, cultivations or freedom from weeds, purity and trueness to type, freedom from insects and disease, general appearance and evenness and yield. Five varieties entered into 6 competitions.—*L. R. Waldron.*

169. Wenholz, H. **The husking of maize. A new type of hook.** Agric. Gaz. New South Wales 36: 423–426. *1 fig.* 1925.—A device is described which has not yet been used in New South Wales. It will probably replace the old-time husking peg.—*L. R. Waldron.*

170. Wimer, D. C., and M. B. Harland. **The cultivation of corn. Weed control vs. moisture conservation.** Illinois Agric. Exp. Sta. Bull. 259. *175–196. Fig. 1–8.* 1925.—This bulletin includes a revision of Bull. 181 (1915) as well as results of more recent investigations. In this corn belt climate weedy corn probably suffers more from a shortage of plant food nutrients than from a moisture deficiency. The need of cultivation is no greater in dry years than it is in wet years, though on heavy soils cultivation may be necessary to close the large cracks which generally appear.—*H. A. Lunt.*

171. Wolfe, T. K. **A mathematical inquiry into the influence of the amount and distribution of rainfall on the yield of corn.** Jour. Amer. Soc. Agron. **17**: 356–362. 1925.—Alternate wet and dry periods are very favorable to corn production. Low rainfall in May and July accompanied by a high rainfall in June and August is conducive to a high yield of corn.—*F. M. Schertz.*

172. Wolfe, T. K., L. W. Osborn, and J. R. Fain. **Suggestions for the certification of seeds of some field crops.** Jour. Amer. Soc. Agron. **17**: 500–508. 1925.—Seed are divided into 3 classes, Elite, Registered and Certified. Standards of quality, are given for each class of seed for cotton, corn, small grains, soybeans, cowpeas, velvet beans and peanuts.—*F. M. Schertz.*

173. Wright, R. C. **Low temperature injury to potatoes in storage.** Proc. 11th Ann. Meeting Potato Assoc. America **1924**: 54–59. 1924.—The extent of undercooling may be influenced by individual differences in the tubers themselves and evidence is available to show that very little undercooling takes place in the center of a large bulk of potatoes. Undercooling itself does not injure potatoes in any way, no injury being apparent until after freezing, no matter how low or how long they are undercooled. Tests with 12 tubers of the Irish Cobbler, Green Mountain and Triumph varieties were conducted to determine how soon a freezing injury may occur after actual freezing commences. At the close of a ½ minute period 2 of the Irish Cobbler variety showed injury, at the end of 2 minutes all of the Green Mountain and Cobbler and 4 of the Triumph variety showed freezing injury. Unless freezing injury has been quite advanced these potatoes keep practically as well as uninjured ones under ordinary good storage conditions. Tubers of the 3 varieties mentioned above were stored at 32, 40 and 50°F. for 2 months when the freezing points were determined. Little difference was apparent between 40° and 50° but between 40° and 32° there was practically a degree depression. This is attributed to the greater sugar content.—In another experiment to determine the effect of previous storage temperatures on freezing injury, tubers of the 3 varieties were kept at 32, 40 and 50° for 3 months when they were subjected to 22°F. until undercooled and then frozen for 45 minutes. In every case greatest injury resulted in the tubers stored at the higher temperatures.—*Wm. H. Martin.*

174. [Zhukovskii, P. M.] Жуковский, П. М. **Исследование крестьянского семенного материала Восточной Грузии.** [**An investigation of the seed material of the peasants of Eastern Georgia.**] Записки научно-прикладных отделов Тифлисского Ботанического Сада. [Bull. Sect. Sci. Appl. Bot., Bot. Gard. Tiflis] Fasc. 3: *127–223.* 1924.—The data concerning the impurities occurring in all the cultivated crops of this region, are tabulated. Besides being of practical local importance, these data are of general interest, as the weed flora has not before been investigated and shows great variety and many peculiarities. The botanical composition of the field weeds is quite similar and constant in all the districts of Eastern Georgia and shows regularity in the formation of field communities. Thus the segetal flora of Transcaucasia is a quite specific one. In Georgia the fields sown to wheat and

barley contain much rye, the latter being of an extraordinary polymorphism. The author considers Transcaucasia to be the Western borderland of the Eastern geographical area of weed rye. The weed forms of oats (*Avena sativa* and *A. fatua*) are also widely spread, particularly among emmer and wheat. According to N. I. Vavilov's theory, oats have found their way into cultivation by passing through the stage of a field weed, admixed with emmer. In Georgia this stage may be observed at the present time.—*E. Sinskaja.*

175. [Zhukovskii, P. M.] Жуковский, П. М. **Персидская пшеница в Закавказве. [Persian wheat—Triticum persicum Vav. in Transcaucasia.]** (English summary.) Труды по прикл. Бот. и селекции [Bull. Appl. Bot. and Plantbreed.] 13¹: 45–58. *1 col. pl.* 1922–1923. [1923].—A Latin description of a new species of wheat called *Triticum persicum* Vav. is given. This wheat has a spike on the whole very similar to *T. vulgare* Vill. differing from the latter by a very thin spike rachis, by long and parallel awns, by long awns on empty glumes, comparatively full straw, and glossy grains covered with a silvery efflorescence. The diploid number of chromosomes is 28. As found by Vavilov it is immune to *Erysiphe graminis* W. C. In crosses with *T. vulgare* Vill. it produces sterile or partially sterile hybrids. This species was recognized and named by Vavilov who obtained the seed from the firm Haage and Schmidt with the statement that it came from Persia. The author found it growing in Transcaucasia when he obtained the material for the description of 4 varieties of this species. All of them are spring wheats. They are: *T. persicum* Vav. var. *stramineum* Zhukovski, which has spikes white, glabrose and aristate, red cariopsis, and grows in the provinces of Gori; *T. persicum* Vav. var. *rubiginosum* Zhukovski, which has spikes red glabrose, and aristate, red cariopsis, and grows in the province of Doushet; *T. persicum* Vav. var. *coeruleum* Zhukovski, which has spikes bluish-gray, villose, aristate, red caryopsis, and grows, in the province of Tiflis; and *T. pers*, Vav. var. *fuliginosum* Zhukovski which has spikes black, villose, aristate, red cariopsis, and grows in the provinces of Doushet, Tiflis and Gori.—In an addition to this paper which was written when the author received Percival's book on "The Wheat Plant," reasons are given why the author can not agree with Percival who named Persian wheat *T. dicoccum persicum* Perciv. Those reasons are: (1) Percival separated emmers into 2 groups: Indo-Abyssinian, and European emmers, and included the Persian wheat in the 1st group. The author thinks that the name "Persian wheat," which was given to that wheat by the firm Haage and Schmidt, misled Percival. Since the author found Persian wheat growing in Transcaucasia, which has a flora typical for Southern Europe, he thinks that Persian wheat can not be placed in the Indo-Abyssinian group as was done by Percival. (2) The other reason why Persian wheat can not be classified with Indo-Abyssinian emmers is the fact that Persian wheat is very late, which is a characteristic of the European emmers. However, European emmers, unlike Persian wheat, have a fragile rachis. (3) Persian wheat differs from all the other emmers because it has long awns on empty glumes. (4) Persian wheat has 2 nerves on the coleoptile and not 3–4–6 as stated by Percival. (5) The grain of all emmers tapers equally toward both ends and the grain of Persian wheat is wider on the germinal end.—*M. Demerec.*

176. [Zhukovskii, P. M.] Жуковский, П. М. **Систематико географические данные о хлебных злаках Закавказья. [Systematic geographical data on the cereals of Transcaucasia.]** Известия Тифлисского Государственного Политехнического Института. [Bull. State Polytech. Inst. Tiflis.] 1: 137–144. 1924.—The author considers Transcaucasia to be one of the principal centers where wheat forms have originated. Many new forms, unknown in literature, were discovered there, as well as interesting hybrids—the results of inter-species and interracial crosses. The author completes his work by a compilation of new data on the systematics and geography of the cereals of this region.—*E. Sinskaja.*

177. [Zhukovskii, P. M.] Жуковский, П. М. **Материалы по изученению пшениц Восточной Грузи. [Wheat crops of Georgia (West Transcaucasia).]** Записки Научно-прикладных Отделов Тифлисского Ботанического Сада [Sci. Papers Appl. Sect. Tiflis Bot. Gard.] 3: 8–40. 1922–1923.—The author finds that ⅔–¾ of all the cultivated wheat in Georgia belongs to *Triticum vulgare* Vill. In the district of Gori, the varieties *erythrospermum* Korn. and *nigroaristatum* are also found. There are also several varieties which are less frequently cultivated, as for instance *ferrugineum* Al., *lutescens* Al. and *milturum* Al. The author also mentions the fact that Libyan wheat, which is believed to occur only in the oases of the Libyan desert, is widely cultivated in Gori.—*L. J. Pessin.*

SOIL SCIENCE (EDAPHOLOGY)

178. Anonymous. [A survey of the soil productivity in Manchuria.] (In Chinese, translated from the Japanese by C. C. Chang.) Jour. Ministry Agric. and Commerce Republic of China 11^5: 1–11. 1924.—The paper presents a tentative analysis of soils in Manchuria. Both quantitative and qualitative studies of the most essential organic and inorganic food elements for crop plants are given. The author hopes that his work will be of interest to those who are planning to colonize or make investments in farming this sparsely populated but tillable region of China.—*C. Y. Chiao.*

179. Adams, Henry R. **Some effects of sulfur on crops and soils.** Soil Sci. **18**: 111–115. 1924.—When S was applied to a Caloma medium sand and a Miami silt loam at rates of 0, 500, 1000, 1500, 2000 and 3000 pounds per acre and incubated for periods of from 0 to 60 days the growth of June clover and alfalfa plants showed that S had little effect, except in cases where the large applications were incubated for several weeks, when the growth above ground was decreased. The acidity and the amount of soluble material increased with the amount of S applied and the length of the incubation period with an apparent correlation between the pH values and amount of soluble material. Plant growth was rather sharply limited on the sand at pH values below 4.3, and on the silt below 3.4, indicating that the acidity toleration of a plant is a property of the soil and not entirely of the plant itself. Results of leaching treated and untreated soils showed that practically all of the soluble Ca and sulphate S were washed from the soil, but the acidity produced by S oxidation was not.—*I. T. Scott.*

180. Allison, R. V. **A note on the protozoan fauna of the soils of the U. S.** Soil Sci. **18**: 339–352. *Fig. 1.* 1924.—Samples of soil from various parts of the U. S. A., were found to be fairly uniform with reference to distribution in them of Flagellates, Ciliates and Rhizopods. Besides, there was marked similarity in the range of type genera of English soils and those of the U. S. A. The methods used in this investigation at the Rothamsted Protozoölogical Laboratory are described. It is suggested that the differences in conclusions of English and American workers regarding biological phenomena following partial sterilzation of the soil may be due to diverse groups of organisms.—*W. E. Maneval.*

181. Arrhenius, O. **Der Kalkbedarf des Bodens.** [**The lime requirement of soils.**] Zeitschr. Pflanzenernahr. u. Düngung **4**: 348–358. 1925.—A brief general discussion, with bibliography of 57 titles.—*F. M. Schertz.*

182. Auguet, Adrien, et Albert Bruno. **Persistence de l'azote dicyanidiamidique dans une cyanamide calcique moulée, après plusieurs mois se séjour dans le sol.** [**The persistence of dicyandiamid nitrogen in a calcium cyanamide deposit, after many months in the soil.**] Compt. Rend. Acad. Sci. Paris **180**: 1436–1438. 1925.

183. Barnette, R. Marlin. **Synthetic calcium silicates as a source of agricultural lime: I. A comparison of the influence of synthetic calcium silicates with other forms of lime as affecting plant growth.** Soil Sci. **18**: 479–491. 1924.—In pot and field experiments the comparative effects of ground limestone, calcium hydrate, calcium oxide, di-calcium silicate ($(CaO_2)\ SiO_2$) and limosil on growth of soybeans, buckwheat and barley, were tested. In general the artificial calcium silicates were as efficient as common forms of lime when applied on an equivalent CaO basis.—*W. E. Maneval.*

184. Barthe, C., and N. Bengtsson. **Action of stable manure in the decomposition of cellulose in tilled soil.** Soil Sci. **18**: 185–200. *Fig. 1.* 1924.—Charpentier's method for the determination of cellulose in soil was further modified and perfected. The favorable influence of stable manure upon cellulose fermentation in the soil is due to the N present in the manure, which is available to microörganisms. Microörganisms added with the manure are of no practical importance in normal soils as sterilized manure was found to act in the same manner as unsterilized manure.—*C. G. Deuber.*

185. Bengtsson, N. **The determination of ammonia in soil.** Soil Sci. **18**: 255–278. 1924.—A number of methods for the determination of NH_3 in soil were examined but found unsatisfactory for recovering added NH_3 quantitatively. Successive extraction with a 4% KCl solution was found to be satisfactory for mineral and peat soils but not for heavy subsoils.—*C. G. Deuber.*

186. Bertrand, Gabriel, et M. Mokragnatz. **Présence générale du nickel et du cobalt dans la terre arable. The presence of nickel and cobalt in arable land.]** Compt. Rend. Acad. Sci. Paris **179**: 1566–1569. 1924.—Analyses are made of various soils from various localities and various geologic formations. Nickel and cobalt are found in all soils of France, and also in all of those examined from Germany, Denmark, Italy, Rumania, and Serbia. Nickel varies from 5.5 to 38.6 mg. per kilogram; cobalt, from 0.3 to 11.7 mg. per kilo. There is always less cobalt than nickel.—*C. H. Farr.*

187. Blair, A. W., and A. L. Prince. **Preliminary note on the distribution of nitrates in soil under corn culture.** Soil Sci. **17**: 323–326. 1924.—Plots which have been under a 5-year rotation for 15 years were studied in a preliminary way in 1923 for the nitrate content of the soil around the growing plant and in the middle of the row. The plots had been treated annually with various applications of fertilizers, 1 series never being limed and the other limed at 5-year intervals. In every case the nitrates were higher in samples of soil in the middle of the row than near the plants in the unlimed plots, while there was but little difference in the limed plots. Possibly the limited root growth on the unlimed, more acid plots was largely responsible for the differences found.—*W. E. Maneval.*

188. Blair, A. W., and A. L. Prince. **Influence of varying ratios of phosphoric acid and potash on crop yield and nitrogen recovery.** Soil Sci. **17**: 327–330. *Pl. 1.* 1924.—With corn, a ratio of 1:2 for N and phosphoric acid resulted in a better yield than a ratio of 1:1 or 1:3. Although neither the amount of phosphoric acid applied nor the form of N influenced appreciably the percentage of N in the dry matter, the form of N did influence markedly the crop yield and the percentage of N recovered, and in the following decreasing order: $NaNO_3$, $(NH_4)_2SO_4$, dried blood.—*W. E. Maneval.*

189. Blair, A. W., and A. L. Prince. **Some changes brought about in cylinder soils by long continued crop and fertilizer treatment.** Soil Sci. **18**: 31–52. *Fig. 1.* 1924.—Cylinder soils heavily fertilized and cropped under controlled conditions for a 25-year period showed a gain in total phosphoric acid content. The apparent loss of phosphoric acid is greater with treatments of 200 pounds per acre than with those of 100 pounds per acre. While larger crops were obtained in the former case the yield was not increased in direct proportion to the increase in fertilizer. It is further shown that with average fertilizer treatment very little phosphoric acid is actually lost in drainage waters, the loss being greatest, however, with the heavier application. Potash determinations showed a loss of this constituent although K was supplied each year in amounts above the general average for the crops used. The total amount applied in 25 years was small in comparison to the amount originally present so that the K supplied could have had but little effect on the final K content. The crops removed K at the average rate of 132.4 pounds per acre annually with the single portion application against 191 pounds per acre with the double-portion application. The greatest loss of K is in the drainage waters and in the crops. Lower CaO content occurred in cylinders where no lime had been added. With 5 exceptions all limed cylinders showed a higher percentage of lime than originally. The greatest loss of lime occurred in cases where $(NH_4)_2SO_4$ had been used without lime or manure. Unlimed soils were acid with pH varying from 4.9 to 6.2, and lime requirement varying from 1400 to 2000 pounds. Limed cylinders had no lime requirement and showed pH values varying from 6.5 to 7.3. There is no indication that continued use of acid phosphate causes the soil to become more acid.—*I. T. Scott.*

190. Bouyoucos, George J. **Effect of ignition at various temperatures upon certain physical properties of soils.** Soil Sci. **17**: 135–139. 1924.—Heat of wetting, unfree water and plasticity of a series of soils were slightly affected at 230°, at 485° these physical properties were greatly reduced, and at 800° they were entirely destroyed and completely disappeared. These results suggest the possibility of evolving a method of determining the colloidal content or condition of soils and their degree of activation.—*C. G. Deuber.*

191. Bouyoucos, George J. **The effect of the colloidal content upon the physical properties of soils.** Jour. Amer. Soc. Agron. **17**: 285–294. 1925.—It is concluded that colloids influence more or less or entirely control practically all the physical properties of soils. Colloids may be regarded as the most important part of soils.—*F. M. Schertz.*

192. Bouyoucos, George J. **The influence of water on soil granulation.** Soil Sci. **18**: 103–108. *Pl. 1.* 1924.—This paper is a critical discussion of the role of water films on soil granulation. The idea is advanced that water brings about the formation of granular struc-

ture by pushing the soil particles apart rather than by pulling them together, thus causing a crumbling of the clods. Water accomplishes this in 2 ways: (1) By the swelling of the colloids, and (2) by diminishing the cohesive force of the particles as the water comes between them and pushes them farther apart. Contrary to the common belief, the forces of contraction are not due to the pulling powers of thinned water films but to the cohesive force of the soil itself.—*I. T. Scott.*

193. Bouyoucos, George J., and M. M. McCool. **The aeration of soils as influenced by air-barometric pressure changes.** Soil Sci. **18**: 53–63. *Fig. 1–7.* 1924.—Barographs were buried in various soil types including the heaviest clays, the barometric pressure being recorded at depths to 10 feet. The barometric pressures at the greatest depth measured corresponded exactly with that of the outside air. From this the authors infer that the soil air has a free communication with the outside air down to the impervious stratum or water-table. They further conclude that the variation in barometric pressure must therefore exert a great influence on soil aeration.—*I. T. Scott.*

194. Bradfield, Richard. **The chemical nature of colloidal clay.** Jour. Amer. Soc. Agron. **17**: 253–270. 1925.—Chemical analyses of a series of colloidal clays from Missouri soils found under humid, temperate conditions indicate that they are rather uniform in composition. The content of Al_2O_3 and Fe_2O_3 is higher and that of SiO_2 lower than in the coarser fraction of the soils. Practically all of the Al_2O_3 and Fe_2O_3 in these colloidal clays is soluble in hot concentrated HCl. The Al_2O_3 and SiO_2 go into solution in about the same relative proportions as found in the total analyses when the clays are digested with dilute alkali solutions. Flocculation studies indicate that many of the colloidal clays are flocculated most readily in an acid medium, while colloidal SiO_2, Al_2O_3, and Fe_2O_3 are all flocculated more readily in an alkaline medium. The evidence seems to indicate that many colloidal clays are composed largely of complex alumino-silicates rather than a mixture of separate colloidal oxides. (See also Bot. Absts. 13, Entry 6266.)—*F. M. Schertz.*

195. Bradfield, Richard. **The importance of hydrogen-ion concentration control in physico-chemical studies of heavy soils.** Soil Sci. **17**: 411–422. *6 fig.* 1924.—Studies of the flocculation of colloidal clay indicate that: (1) The electrolyte requirement of a clay for any electrolyte can only be defined with reference to a definite pH value; (2) the natural reaction of the clay determines the type of curve to be obtained; (3) the concentration of the clay is an important factor with alkali but of much less significance with acid or neutral flocculants; (4) the amount of various common acids required for flocculation varies widely if expressed as total acidity, but they all flocculate at approximately the same pH value. Studies of the absorption and exchange of bases by colloidal clay indicate that: (1) Salt treatments which increase the H-ion concentration of the solution liberate more equivalents of bases than are absorbed; (2) salt treatments which do not change the pH value of the clay cause equivalent exchange; while (3) with treatments which decrease the H-ion concentration of the clay more bases are absorbed than exchanged. Thus all the types of exchange encountered in the literature may be obtained with the same clay and the same metallic ion by the proper manipulation of the H-ion concentration.—*Author.*

196. Brown, P. E., and W. J. Hart. **Soil inoculation with azotobacter.** Jour. Amer. Soc. Agron. **17**: 456–473. 1925.—Small quantities of N increased the N fixing power of *Azotobacter chroococcum*, *A. vinelandii* and *A. beijerinckii* in cultural solutions. Inorganic forms of N were more stimulating than organic forms. Inoculation of the soil with *Azotobacter* is not yet practical but indications point to a future practical utilization of this method of increasing and maintaining the N content of soils. Wheat yield was not increased by inoculation with *Azotobacter*, although N accumulated in the soil.—*F. M. Schertz.*

197. Burd, John S., and J. C. Martin. **Secular and seasonal changes in the soil solution.** Soil Sci. **18**: 151–167. 1924.—The composition of solutions obtained by water displacement from 7 fine sandy loam soils is given. Each of the soils was subjected to 3 treatments over a period of 8 years: (1) Barley for every season, (2) barley the 1st year, fallow all succeeding years, and (3) air-dried and stored in tightly covered bins for the entire period. The analyses show that continuous cropping invariably decreases the concentrations of the displaced solutions; fallowing increases the concentrations of the solutions except of soils in a high state of fertility. In continuously cropped soils the seasonal decrease of concentration of the dis-

placed solution characteristic of soils in general is temporary, and it may be expected that such soil solutions will increase to their initial concentrations by the beginning of the next season. The fluctuations of phosphate concentration are thought to depend primarily upon the reaction of the solution, although the concentrations of certain cations are also involved. Evidence is presented tending to show that the qualitative composition of the soil solution in soils under crop is constantly changing.—*I. T. Scott.*

198. Burgess, P. S. **The effect on present soil reaction of long-continued applications of equivalent amounts of high-calcium and high-magnesium limes.** Soil Sci. **18**: 169–172. 1924.—Results with liming practices over a 15-year period indicate that finely ground limestones are less permanent in their effects on acid soils than are the hydrated limes and that during the past 7 years, high-magnesium hydrate has produced somewhat larger crops than high-magnesium limestone, high-calcium hydrate or high-calcium limestone.—*C. G. Deuber.*

199. Comber, N. M., and S. J. Saint. **Note on the absorption of bases by soils.** Soil Sci. **18**: 131–132. 1924.—Results of experiments supporting a criticism of work by Jones (Soil Sci. **17**: 255–273. 1924) are presented showing that the amount of CO_2 evolved when normal alkali carbonates react with soil is not a measure of the amount of base absorbed.—*I. T. Scott.*

200. Couturier, F., et S. Perraud. **Sur quelques propriétes de l'urée vis-a-vis des sols. [Certain properties of urea in soils.]** Compt. Rend. Acad. Sci. Paris **180**: 1433–1436. 1925.—The amount transformed is proportional to the time during the first 24 hours, and is independent of temperature and season.—*C. H. Farr.*

201. Dachnowski, A. P. **The stratigraphic study of peat deposits.** Soil Sci. **17**: 107–133. *Pl. 1–5, fig. 1–2.* 1924.—Profile studies have shown 2 important divisions of peat deposits: (1) Those which developed in water basins and under conditions of poor drainage and (2) those which developed on moist flat land under conditions of a rising or fluctuating water table. The characteristics of the different groups of peat material and thorough directions for the examination of peat deposits are discussed with special reference to the needs of the soil survey worker.—*C. G. Deuber.*

202. Dayhuff, Walter C., and D. R. Hoagland. **The electrical charge on a clay colloid as influenced by hydrogen-ion concentration and by different salts.** Soil Sci. **18**: 401–408. 1924.—The colloid remained negatively charged at all pH concentrations (pH 2.1–12.7) used. The nature and concentration of the cations in the medium were the main factors influencing the stability of the suspension.—*W. E. Maneval.*

203. De Sigmond, Alexius A. J. **The alkali soils in Hungary and their reclamation.** Soil Sci. **18**: 379–381. 1924.—This is a brief report on a monograph by the author.—*W. E. Maneval.*

204. Duley, F. L. **Easily soluble calcium of the soil in relation to acidity and returns from liming.** Soil Sci. **17**: 213–228. 1924.—A soil will probably yield well regardless of considerable acidity, if it is well supplied with N and P and a fair amount of Ca soluble in carbonated water. If the amount of Ca soluble in carbonated water was low, applications of limestone produced a greater return than if there was already a considerable amount of soluble Ca present.—*W. E. Maneval.*

205. Erdman, Lewis W. **The effect of sulphur and gypsum on the fertility elements of Palouse silt loam.** Jour. Agric. Res. **30**: 451–462. 1925.—The author carried out 2 pot experiments for the purpose of ascertaining to what extent the S, K, P, N, Ca, and Mg of the Palouse silt loam are affected by applications of uninoculated S, inoculated S and gypsum. In experiment 1 the treated soils were exposed to natural weather conditions for a little over 6 months. The drainage water from each pot was collected for each month and analyzed for S, N, P, K, Ca, and Mg. In experiment 2 the soils in the pots were treated identically as in experiment 1 but were kept in the greenhouse under optimum moisture conditions for 72 days. At the end of this time all of the soils were flooded with definite amounts of distilled water for 4 consecutive days and the leachings thus obtained were collected and analyzed. Soil extracts made from the soils in each pot at the close of the experiments were also analyzed. It was concluded from these experiments that the Palouse silt loam has a high sulphofying power and the uninoculated S was just as efficient as the inoculated S in producing sulphates. Gypsum and S were readily leached out of the soil during the winter months. All of the treatments increased the

availability of the native soil K. Under greenhouse conditions elemental S increased the loss of Ca in the leachings. Magnesium compounds in the soil were but little affected by S and gypsum. These treatments also had very little effect upon nitrification in this soil.—*Author.*

206. Fisher, E. A. **A note on soil shrinkage.** Jour. Agric. Sci. **14**: 126–132. 1924.—A review and criticism of a recent paper on soil shrinkage by W. B. Haines. (See this issue, Entry 217.)—*R. P. Marsh.*

207. François-Perey, Mme. Jean. **Influence du milieu de culture sur les numérations de protozoaires du sol. [Influence of the media on the number of soil protozoa.]** Compt. Rend. Acad. Sci. Paris **180**: 1315–1317. 1925.—The number of individuals of any species varies with the medium. Cutler's medium was compared with a gelatinous soil decoction. It is concluded that each medium is favorable to some species and detrimental to others.—*C. H. Farr.*

208. Gainey, P. L. **The nitrogen problem from the Kansas point of view.** Jour. Amer. Soc. Agron. **17**: 90–91. 1925.—The necessity of maintaining the N content of the soil is stressed, and a better utilization of the free-living nitrogen-fixing bacteria of the Azotobacter group is being investigated. These organisms are absent, due to an acid condition of the soils, from half of the soils of Kansas.—*F. M. Schertz.*

209. Ganssen, R. **Das Wesen, die Bedeutung und die Bestimmungsmethoden der Bodenazidität. [The nature, significance and methods of determining soil acidity.]** Zeitschr. Pflanzenernähr. u. Düngung **4**: 237–238. 1925.

210. George, W. T. **Iron, aluminum and manganese in the soil solution of Hawaiian soils.** Soil Sci. **18**: 1–11. 1924.— Analyses and titrations of KNO_3 extracts of characteristic types of Hawaiian soils before and after dialysis were made, as well as analyses of the soil solutions obtained by the Parker displacement method before and after dialysis. The author finds that normal KNO_3 does not displace the Al in aluminum silicates except in soils with pH values less than 6.0. Soluble crystalloid salts of Fe, Al and Mn were found in soils with pH less than 5.8. Mn was not found in the soil solution at pH values of 6.0 or above, Fe and Al being present only as hydrosols of ferric and aluminum hydrates. The solubility of Mn as shown by the Comber test is due to the increased H-ion concentration developed from treatment of the soil with KSCN.—*I. T. Scott.*

211. Gile, P. L. **The colloidal content of soils.** Jour. Amer. Soc. Agron. **17**: 270–275. 1925.—This paper is a brief summary of recent work in the U. S. Bureau of Soils concerning what material in the soil is colloidal, methods of estimating the colloid content of soils by determining how the adsorption or heat of wetting of the whole soil compares with that of a sample of the isolated colloid, the quantity of colloid in soils, and the homogeneity of the soil colloidal material.—*F. M. Schertz.*

212. Goseco, Andres P. **Renovating the soil with legumes. Their advantages on sugar lands.** South African Sugar Jour. **9**: 325, 327. 1925.—The steps leading to the discovery of the N-gathering bacteria in leguminous plants and the process by which these bacteria benefit the soil are briefly sketched and the special benefits enumerated. There is a wide variation in the amount of N fixed in the root systems of different legumes. A table shows the amounts fixed in the roots of 4 of the different leguminous plants grown in the Philippine Islands. Other parts of legumes also contain considerable amounts of N. A table shows the approximate N content of the leaves and stems of 20 kinds of these plants. Of the various legumes growing in the Philippine Islands the cowpea, patani, and mungo are the best for sugar plantations. These plants and methods of planting them are described. If these 3 were grown to a large extent and plowed under in sugar plantations the texture of the depleted soils would be improved in a short time and more sugar produced.—*Nellie E. Fealy.*

213. Gowda, R. Nagan. **Nitrates and nitrification in field soils.** Soil Sci. **17**: 333–342. *Fig. 1.* 1924.—The effect of various fertilizer treatments, moisture content and seasonal conditions on nitrifying power and nitrate content of an Iowa soil was determined. In all plots nitrates accumulated in June, decreased gradually in July, and rapidly in August and September to a minimum. Optimum moisture content for nitrification was 18%. Effects of manuring and fertilizer treatments are given in some detail.—*W. E. Maneval.*

214. Grossfeld, J. **Vereinfachte Verfahren Zur Kalkbestimmung in Ackerboden. [Simplified methods for lime determination in arable soil.]** Zeitschr. Pflanzenernähr. u. Düngung 5: 93–103. 1925.—A direct and an indirect method are described.—*F. M. Schertz.*

215. Guittoneau, G. **Sur la formation d'hyposulfites aux depens du soufre par les micro-organismes du sol. [The formation of hyposulphites from sulphur by the microörganisms of the soil.]** Compt. Rend. Acad. Sci. Paris 180: 1142–1144. 1925.—The organisms involved are found to be a bacterium resembling *Bacillus vermiculosus*, also a coccobacillus, and 2 species of microsiphons.—*C. H. Farr.*

216. Hager, J. **Das Wesen, die Bedeutung und die Bestimmungsmethoden der Boden-aziditat. [The nature, significance and methods of determining soil acidity.]** Zeitschr. Pflanzenernähr. u. Düngung 4: 227–228. 1925.

217. Haines, W. B. **The volume changes associated with variations of water content in soil.** Jour. Agric. Sci. 13: 296–310. 1923.—"(1) A new and simple method of measuring the shrinkage of moist soil on drying is described, which at the same time gives values for the pore space and specific gravity of the soil. (2) Diagrams for a number of diverse soils are given, illustrating the character of soil shrinkage. (3) The shrinkage is shown to take place in two stages in both of which there is a linear relationship to the moisture content. (4) Tentative explanations of these two stages are advanced, based on the well-known colloidal-coating hypothesis, and confirmatory experiments described. (5) By means of the method the effect of alternate wetting and drying of soil in producing a good tilth is illustrated." (See also this issue, Entry 206.)—*Author's summary.*

218. Hall, T. D. **Nitrification in some South African soils. Part II.** Soil Sci. 18: 219–235. *Fig. 1–3.* 1924.—Studies of the nitrifying powers of 30 soils from the Transvaal are reported. The factors considered were (1) seasonal variations in NO_3 content, (2) the influence of wintering, (3) the nitrifying power of various depths of cultivated and uncultivated soil, (4) NO_3 contents of soils before and after drying in the laboratory, and (5) nitrification in acid soils.—*C. G. Deuber.*

219. Halversen, William V. **A study of the biological activities in certain acid soils.** Oregon Agric. Exp. Sta. Bull. 211. *1–26.* 1925.—The micro-flora of these soils (Willamette Valley, Oregon) under greenhouse conditions shows a response to the application of lime that is in keeping with the reports of investigators in other sections of the country. (1) The ammonifying power is little affected by liming, which would indicate that crops capable of utilizing NH_3 as a source of N need not starve. (2) The nitrifying power of these soils is greatly stimulated by the application of lime. This would lead one to believe that plants requiring nitrates will not give maximum yields and will suffer from lack of N unless at least part of the lime requirement is satisfied. Since the soil remains cold and wet until about the middle of May and this condition is quickly followed by a dry cool summer, there is normally such a short period of optimum moisture and temperature conditions for bacterial action in the soil that moisture plays a big part as a limiting climatic factor. It is only logical to believe from the evidence given that these soils, under field conditions, will respond to the application of lime if a sufficient amount is added in a finely divided state unless other limiting factors such as a lack of available phosphorus, or unfavorable climatic conditions, obscure any such response.—*From author's summary.*

220. Hardy, F. **Liming as a means of soil amendment.** West Indian Bull. 19: 161–189. 1922.—A review is presented of the different theories of the effect of liming on the physical and chemical composition of the soil, and the interrelationship of the various soil reactions is discussed. Attention is given to the lime deficiency of certain soils, the antogonistic effect of Ca-ion, the precipitation of toxic substances by lime and the possible indirect fertilizing effect in causing an exchange of ions in the soil. The various methods of measuring the lime requirements of soils are described. It is concluded that acidity of the soil is not always an objectionable condition and that in certain instances it may even be beneficial in controlling plant disease and preventing malnutrition. It is emphasized that liming in the future must be regarded as an exact operation to be performed only when the various factors involved for any particular soil and for any particular crop are known and that there is much need for future investigation, not only in the laboratory but also in the field, before such accurate information is available.—*T. D. Rice.*

221. Hardy, F. **Studies in West Indian soils II. The soils of Monserrat, their natural history and chief physical properties and the relationship of these to the problem of die-back of lime trees.** West Indian Bull. **19**: 189–213. *1 pl.* 1922.—This is a 2nd report on West Indian soils in which the geology and physical characteristics of the soils of Monserrat are described, and the properties of the soils with relation to the cause of die back are considered in some detail. The rocks of Monserrat are composed mainly of fragmentary volcanic material derived from igneous rocks of sub-alkaline type, chiefly hypersthene andesite, which has been consolidated into agglomerates, brecchias and tuffs. Erosion has produced conspicuous talus slopes chiefly in the southern part of the island. The surfaces of these slopes have been cut by numerous ravines. In the northern part of the island, the consolidated rocks appear near or at the surface. The soils of Monserrat are subdivided in accordance with their geological origin into 2 main types, talus soils and shoal soils. The shoal soils have been subdivided into humid upland soils, hilly land soils and valley soils. The agencies that have produced these subtypes are mainly climatic and topographical. The chief physical features of these types and sub-types are described in the text and the results of laboratory examination are presented in tabular form and discussed.—In the 2nd part of this report the die back of lime trees is presented in historical and general outline. It is considered that the chief factors responsible for die back are intimately connected with the water relation between lime trees and their environment.—In the 3rd part, an outline is given of the laboratory methods used in the examination of the soil samples collected in connection with the investigation.—*T. D. Rice.*

222. Hardy, F. **Synthetic farmyard manure.** Internat. Sugar Jour. **27**: 302–303. 1925.—The raw material used in the production of manure by the Adco process is the same as that used for farmyard manure, the difference being that its ingredients are synthesized by added bacterial stimulants instead of through the intervention of animals. Hence, the proprietors of the Adco process desire to describe their product as synthetic rather than artificial manure, the latter term giving the erroneous impression that their fertilizer is of an inorganic or chemical nature. In the decomposition of plant residues, sugars, pentosans, and starches are first consumed by a variety of organisms, notably fungi. It seems likely that these carbohydrates are built into living cell material, which at a later stage is broken down and provides the most available type of organic matter in the finished manure. Cellulose, which decays comparatively slowly, supports and distributes the decomposition products of the other simpler carbohydrates. Reducing sugars in moderate amount and higher N compounds, if non-bactericidal, assist rather than hinder the formation of a satisfactory manure. The microörganisms concerned in cellulose fermentation require N for their sustenance, and if a sufficient supply is lacking in the raw material it is necessary to add nitrogenous compounds. The Adco Company does this through a reagent the formula for which has not yet been divulged, but which contains no $(NH_4)_2SO_4$. Because of the very limited extent to which fixation of atmospheric N proceeds during the manufacture of synthetic manure the actual gain from that source is very limited, seldom exceeding 0.5% of the weight of the straw used as raw material. This is explained on the ground that there is usually only a limited amount of suitable carbohydrate available for the nourishment of the microörganisms that can assimilate either atmospheric N or chemically combined N and that when the supply has been exhausted no further assimilation can occur, and so fermentation then proceeds very slowly. If the supply, on the other hand, is considerable and the amount of N present in the manure is insufficient the N-assimilating microörganisms may draw on the reserves of N in the soil and the manure may then exert a depressing effect on crop yield when first applied. It is a difficult matter to arrange the proper balance of N to carbohydrate when manure is made by stock treading litter, but when once the normal composition of the raw material has been determined a well-balanced manure can be produced by the Adco process without loss of the valuable fertilizing constituents.—*Nellie E. Fealy.*

223. Harper, Horace J. **A study of the thiocyanate test for acid soils with particular regard to various organic solvents.** Jour. Amer. Soc. Agron. **17**: 492–500. 1925.—The use of the Comber thiocyanate test for acid soils can be recommended for laboratory studies where rate of settling is not an important factor and where moist soils can be dried before being tested.

As a general test for acid soils under field conditions, a solution composed of 60% CH_3OH and 40% $(CH_3)_2CO$ containing 5% KCNS is recommended.—*F. M. Schertz.*

224. Harper, Horace J. **The determination of ammonia in soil.** Soil Sci. **18**: 409–418. *Fig. 1.* 1924.—There is no general agreement regarding the best method of determining NH_3 in soils. The errors involved were investigated and a more accurate method was developed. The method recommended is to extract the soil with a strong solution of KCl and to distill the extract with MgO to liberate the NH_3. This method is said to be both simple and rapid.—*W. E. Maneval.*

225. Harper, Horace J., and H. G. M. Jacobson. **A comparison of several qualitative tests for soil acidity.** Soil Sci. **18**: 75–85. 1924.—Results of tests for soil acidity made with 51 soils secured from Wisconsin, Missouri, Illinois and Iowa using the following methods are presented: Electrometric determination of H-ion concentration, "Soiltex," Truog test, Comber potassium thiocyanate test, Comber potassium salicylate test, "Richorpoor," and "The Iowa test." The Truog test and the Comber potassium salicylate were the only methods giving accurate results on very wet soils. "The Iowa test" is accurate with soils containing less than 20% moisture, while the "Richorpoor" test gives satisfactory results only on dry soils. The different colors produced when ferric thiocyanate is formed in various organic solvents, are discussed.—*I. T. Scott.*

226. Hendrickson, B. H. **Soil acidity in relation to soil type groups in Nacogdoches County, Texas.** Soil Sci. **18**: 383–385. *Fig. 1.* 1924.—The acidity of 5 types of soils was studied. Variations in reaction within a particular soil type were found to be correlated with physical variations due especially to slope, resulting in differences in texture, organic content and drainage. In the case of different well-weathered types, leached of limestone, fairly consistent differences in acidity were found.—*W. E. Maneval.*

227. Hentschel, Robert. **Präparierte Holzkohlbriketts alls billigste Kohlsäuredüngung. [Prepared charcoal briquets for cheap CO_2 manuring.]** Möllers Deutsch. Gärtnerzeitg. **40**: 223–224. 1925.—Good results were obtained by a simple treatment of prepared charcoal briquets, for CO_2 manuring. Briquets are started burning slowly and develop CO_2 abundantly. Gassed cucumbers in the greenhouse were better developed than the non-gassed ones. In the case of forcing lettuce plants set March 6, they were cut April 11 when gassed, whereas non-gassed plants on April 20 were not as well developed as the others were on April 11. Also cuttings are better when gassed. Others methods for applying CO_2 to plants are expensive.—*J. C. Th. Uphof.*

228. Hesselink, E. **Hoeveelheid organische stof op den bodem in een 22-jarig grove dennenbosch te Nunspeet. [Quantity of organic matter in the soil of a 22 year-old pine forest in Nunspeet.]** Landbouwk. Tijdschr. **37**: 181–182. 1925.—From each examination it was proved that dry organic matter per 1 M^2 of a 22 year-old forest of *Pinus sylvestris* (1st generation) was about 5 kg, where moss covered the soil, and about 8 kg. where moss had not developed. This makes a difference of 50,000 to 80,000 kg. per ha.—*J. C. Th. Uphof.*

229. Hibbard, P. L. **Alkali soils, origin, examination, and management.** California Agric. Exp. Sta. Circ. 292. *1–14.* 1925.—The purpose of this circular is to present in brief form the best available information on the subject of alkali soils in respect to origin, nature, effects, examination, treatment and cropping. The physiological effects of alkali on plants and the factors that govern the tolerance of plants for soil alkali are discussed. The conclusion is drawn that chemical analyses of alkali soils are usually of little value on account of the irregular distribution of alkali, and that the conditions of crops should be a guide in the collection of samples for analysis.—*A. R. C. Haas.*

230. Hissink, J. **Das Wesen, die Bedeutung und die Bestimmungsmethoden der Bodenazidität. [The nature, significance and methods of determining soil acidity.]** Zeitschr. Pflanzenernähr. u. Düngung **4**: 235–236. 1925.

231. Hudig, J. **Das Wesen, die Bedeutung und die Bestimmungsmethoden der Bodenaziditat. [The nature, significance and methods of determining soil acidity.]** Zeitschr. Pflanzenernähr. u. Düngung **4**: 229–231. 1925.

232. Janson, A. **Die Zunehmende Stalldüngernot. [The increased lack of stable manure.]** Gartenwelt **28**: 407–409. 1924.—In several parts of Germany there is an increasing

lack of stable manure, due to the use of motors. Even in the seventies it became gradually apparent after the use of the bicycle.—*J. C. Th. Uphof.*

233. Jennings, D. S. **A statistical study of the distribution of soil material in the United States according to the size of its particles.** Soil Sci. **17**: 469–485. *5 fig.* 1924.—Histograms representing the average textural composition of the 13 soil divisions of the U. S. A. have been worked out from the data of Bulletin 96 U. S. Bur. of Soils. It was found that the ratio of the area of separate 5 to the total area is approximately constant, for the 13 divisions. This ratio expressed, as a percentage, is 14.32–0.39. The standard deviation and probable errors are less for separate 5 than for separates 4, 6, and 7, while the coefficient of variability is less for separate 5 than for any other separate except 1. The same relative condition with respect to separate 5 maintains for 229 smaller areas well distributed throughout the U. S. A. Each histogram was characterized by a mode in either separates 4 or 6 and the constancy of separate 5 is explained on this basis. In order to explain the position of the mode the distribution of the soil from several parent rock-types was studied. It was shown that (1) quartz-bearing, igneous rocks tend to give soils low in silt and high in sand and clay, (2) soils whose parent rock are mixtures of sandstone and shale approximate the average texture, and (3) limestone, slate, shale, and loessial material tend to give soils of high silt and low sand content. These criteria have been applied to 8 of the 13 soil divisions and offer an explanation of the distribution of soil classes. Sufficient geological and pedological data are not at hand to treat the other 5 divisions. It was also shown that the "general mean" which probably represents the average soil class of the U. S. A., is a loam.—*Author's summary.*

234. Jensen, S. Tovborg. **Om Bestemmelse af Jordens Stodpudevirkning. [Determination of the buffer effect of soil.]** (English summary.) Tidsskr. Planteavl. **30**[4]: 565–585. *Fig. 21.* 1924.—The effect of the $CaCO_3$ reaction on soils was studied. Graphs are presented showing the buffer reaction of soil acids. Titration curves are also compared with standard curve, in which pure quartz sand (buffer-free soil) was used.—*Albert A. Hansen.*

235. Joffe, J. S., and H. C. McLean. **Alkali soil investigations: A consideration of some colloidal phenomena.** Soil Sci. **17**: 395–409. *2 fig.* 1924.—Incubation of alkali soil with S or alum increased the surface tension of the soil extract and the rate of leaching. The addition of H_2SO_4 or alum to extracts of alkali soils coagulated the colloids, the effect of alum and H_2SO_4 in combination being greater than that of either alone. At pH 4.7 coagulation was instantaneous, indicating that reaction as the isoelectric point. Incubation of alkali soils with S or alum had little effect upon the lowering of the freezing point or the vapor pressure of the extracts. The colloids of alkali soils are negatively charged and are precipitated by positively charged colloids or by electrolytes with cations of high valency. The nature of the impermeability of alkali soils and the protective effect of colloidal silica and organic colloids are discussed.—*W. J. Robbins.*

236. Joffe, J. S., and H. C. McLean. **Alkali soil investigations: II. Origin of alkali soils; physical effects of treatments.** Soil Sci. **18**: 13–30. *Fig. 1–8.* 1924.—Results of work from various sources on alkali soils are summarized. The authors conclude that the theory of base exchange is the corner stone of research on the origin of alkali soils. The work of Gedroiz is reviewed in some detail. Alkali soils were treated with S, alum and peat. Curves showing capillary rise of water in both leached and unleached alkali soils subjected to various treatments are presented.—*I. T. Scott.*

237. Joffe, J. S., and H. C. McLean. **Alkali soil investigations: III. Chemical effects of treatments.** Soil Sci. **18**: 133–149. 1924.—Analyses of leachings and soil extracts of alkali soils treated with S, S plus peat, alum plus peat, alum plus S and peat alone, were made after various incubation periods. Treatment with 2000 pounds of S is not sufficient to bring about a complete transformation of the alkali soils. The sum total of H-ions available from 2000 pounds of S is not sufficient for replacing the zeolitic cations and neutralizing the existing and potential soda. The evidence presented seems to indicate the calcium-soda character of the alkali soil used, and that it is probably in a process of formation or in process of desalinizing, such postulations being based on theories advanced by Gedroiz.—*I. T. Scott.*

238. Joffe, J. S., and H. C. McLean. **Alkali soil investigations. IV. Chemical and biological effects of treatments.** Soil Sci. **18**: 237–253. *1 fig.* 1924.—An alkali soil was

treated with S and with alum at several rates, applied to the surface 4 inches and mixed with the bulk of the soil. Analyses were made of the leaching of samples at various periods. Numbers of bacteria in the soil as influenced by S and alum treatments are given, together with an experiment on nitrification. The treated soils supported some growth of barley and a fair growth of millet after leaching.—*C. G. Deuber.*

239. Jones, Carleton P. **Adsorption and absorption of bases by soils.** Soil Sci. **17**: 255–273. *Fig. 1.* 1924.—Soils contain as common inorganic colloids, silicic acids, silicates, aluminum, and iron hydroxides; and as organic colloids, humic acids, and microörganisms and some of their secretions. These colloids may absorb or adsorb various kinds of substances. Adsorption, a surface phenomenon, is quite small in soils, while absorption, a physico-chemical reaction, may be quite large. This absorption of bases depends on composition of the salt, concentration, temperature and ionization. The experimental work was on the absorption of carbonates, especially $CaCO_3$, using silty loam, sand, and clay under various conditions.—*W. E. Maneval.*

240. Jones, J. S. **Soil series and types from the standpoint of hydrogen-ion concentration and lime requirement.** Soil Sci. **18**: 65–74. 1924.—Electrometric determination of the H-ion concentration of numerous samples of soils collected in Benton County, Oregon, were made. These samples represented 11 soil series based on a recent soil survey. Lime requirements were also determined. Samples from the same series showed considerable variation in range of pH values in some cases, while 1 or 2 series showed greater uniformity. The maxima, minima, and average pH values and lime requirement for each type of soil are tabulated. No correlation seems to exist between the intensity of a soil's reaction and its lime requirement as determined by the Albert method.—*I. T. Scott.*

241. Knickmann, Erich. **Untersuchungen zur Frage der Bodenazidität. [Soil acidity.]** Zeitschr. Pflanzenernähr. u. Düngung **5**: 1–92. 1925.—A review of the question of soil acidity.—*F. M. Schertz.*

242. Kvapil, K., et A. Němec. **Sur la relation entre la capacité absolue de l'air et le degré d'acidité des sols Forestiers. [Relation between the absolute air capacity and the degree of acidity of forest soils.]** Bull. Trimest. Soc. Forest. Franche Comté et des Provinces de l'Est **16**: 68–70. 1925.—The substance of a note presented at the session of the Academy of Sciences of November 17, 1924, is presented. The authors consider that the absolute air capacity of the soil or the volume of the pores of the soil which after its saturation with water remain filled with air, deserves detailed study as an important factor in the fertility of forest soils. They give figures for the acidity expressed as H-ion concentration and for the absolute air capacity for coniferous stands of different ages, for broadleaf stands of beech, oak, and ash, and for mixed stands. They find that the absolute air capacity of the soil under dense stands of coniferous trees is lower than under others and that it decreases as the acidity of the soil layers high in organic matter increases. In the mixed forest soils the relation is less well defined although usually the absolute air capacity is higher than for the coniferous forest soils.—*J. Kittredge, Jr.*

243. Lebedjantzev, A. N. **Drying of soil as one of the natural factors in maintaining soil fertility.** Soil Sci. **18**: 419–447. 1924.—Soil samples were obtained by making borings 5–7 inches deep. They were mixed, sifted and one part dried in the open air at ordinary temperatures until only 3–6% of moisture remained while the other part contained 25–35% moisture (on basis of dry weight). Millet, oats, and buckwheat were grown in these soils with 33% moisture present. In many cases drying of the soil in pot experiments was accompanied by an increase of all 3 crops. Uncultivated soils and those long in grass were more responsive than those under continuous cultivation. Other conditions being equal, as fertility of a soil decreased the response to drying increased. Different plants behaved differently. Repeated drying and moistening (triple best) of the same sample increased yielding capacity more than 1 drying. Drying was accompanied by increased solubility of organic substances, increase in N and P and decrease in microörganisms. The general conclusion is that drying is an important factor in soil fertility especially where mechanical cultivation is employed to increase fertility.—*W. E. Maneval.*

244. Lemmermann, O. **Das Wesen, die Bedeutung und die Bestimmungsmethoden der Bodenazidität.** [The nature, significance and methods of determining soil acidity.] Zeitschr. Pflanzenernähr. u. Düngung **4**: 222–226. 1925.

245. Leonard, Lewis T., and S. H. Newcomer. **The effect of nodule-formation and seed-production of growing soybeans on soil treated with sulphur dioxide.** Jour. Amer. Soc. Agron. **17**: 309–312. 1925.—Treatment of field soil with SO_2 and HCHO in 1% concentrations showed that the nodule formation was inhibited on the upper parts of the roots of Peking soybeans. Sulphorm, a combination of SO_2 and HCHO, when applied in the same concentration, did not inhibit nodule formation to a like extent. Sulphorm-treated plots gave 20% more seed than did controls.—*F. M. Schertz.*

246. Lipman, C. B., and M. E. Wank. **The availability of nitrogen in peat.** Soil Sci. **18**: 311–316. *Fig. 1–2.* 1924.—Peat untreated or treated with acid and with acid plus steam under pressure was a very inferior source of available N as compared with $NaNO_3$ or $(NH_4)_2SO_4$ in 1 experiment with barley on a soil that responds to N fertilizers.—*C. G. Deuber.*

247. Lipman, J. G. **The fixation of nitrogen under field conditions.** Jour. Amer. Soc. Agron. **17**: 450–455. 1925.—The problem of N fixation under field conditions is so vast and many sided as to assume the proportions of a major factor in our national economy. More efficient types of legumes and bacteria both symbiotic and non-symbiotic must be sought, for commercial N can supply only a small fraction of the N requirements of crops.—*F. M. Schertz.*

248. Löhnis, F. **Bacterial nitrogen fixations.** Jour. Amer. Soc. Agron. **17**: 445–450. 1925.—This paper points out the value of bacterial N fixation. Inoculation of the soil with active non-symbiotic N bacteria has failed because the dominating influence of the environmental conditions were not properly considered.—*F. M. Schertz.*

249. McCool, M. M., and A. G. Weidemann. **A study of several organic soil profiles.** Soil Sci. **18**: 117–129. *Pl. 1.* 1924.—Where the water content of an organic soil is high the amount of unfree water it will hold, as determined by dilatometer studies is greater. Air drying and then thoroughly moistening the soil has no effect on the amount of unfree water it will hold. Fine-textured organic soil removed from the deposit while wet and allowed to dry in large chunks will take up water very slowly. The physical condition has no influence on the amount of heat generated on wetting but the finer material produces heat at a greater rate than the coarser material. Evidence is presented tending to show a very close relationship between the heat of wetting and the unfree-water-holding capacity of organic soils.—*I. T. Scott.*

250. McCool, M. M., and A. G. Weidemann. **Further studies on soil profiles.** Soil Sci. **18**: 181–183. 1924.—The heat-of-wetting method was used in studying the soil profiles of 7 mineral and 2 muck soils of Michigan.—*C. G. Deuber.*

251. McCool, M. M., and L. C. Wheeting. **The influence of the removal of colloids on some soil properties.** Soil Sci. **18**: 99–102. 1924.—A method for removing the colloids from soil is given. Titration curves with limewater on normal soils and on soils minus colloids indicate that a removal of colloids brings about a decrease in both the H-ion concentration and the amount of limewater necessary to bring about neutrality. The heat of wetting and the amount of water held in the combined form were decreased by the removal of colloids, while the amounts of capillary adsorbed and free water were increased.—*I. T. Scott.*

252. McGeorge, W. T. **The influence of silica, lime, and soil reaction upon the availability of phosphates in highly ferruginous soil.** Soil Sci. **17**: 463–468. 1924.—As indicated by growth of sugar cane under experimental conditions there is a definite relation between availability of phosphoric acid and soil reaction, forms of lime present and availability of silica in Hawaiian soils.—*W. E. Maneval.*

253. McGeorge, W. T. **The value of soil analysis when limited to an intensive single cropping system.** Soil Sci. **17**: 457–462. 1924.—This is a brief presentation of a paper to be published in detail later as a bulletin.—*W. E. Maneval.*

254. MacIntire, W. H., and W. M. Shaw. **The effect of soil suspensions upon the solubility of the sulfate radical in the system $Ca(OH)_2$-$CaSO_4$-H_2O.** Soil Sci. **17**: 65–89. 1924.—The influence of $Ca(OH)_2$ in causing the soil to retain more native and engendered sulphates and added $FeSO_4$ was studied.—*C. G. Deuber.*

255. Makinoff, I. A. **Experiments with bacterial soil fertilizing preparations.** Soil Sci. 17: 19–29. *Pl. 1.* 1924.—The results of 1 experiment with sand cultures and a number of field trials in various parts of Russia on inoculation with *B. radicicola* are reported. In the field trials the greatest success with inoculation was obtained when Thomas slag, lime, or both were applied.—*C. G. Deuber.*

256. Makinoff, I. A. **Is it possible to make a bacterial soil preparation for non-legume crops?** Soil Sci. 17: 31–38. *Pl. 1–2.* 1924.—Oats grown on peat soil inoculated with *Azotobacter* and cellulose bacteria increased the yield 257%. Similar experiments are reported with vetch, clover, timothy and barley on several soils.—*C. G. Deuber.*

257. Mason, T. G. **The ecological significance of soil shrinkage.** West Indian Bull. 19: 125–137. 1922.—A correlation was found by Francis Watts to exist between the condition of cacao in certain valleys of Dominica and the percentage of linear shrinkage of the soil on air drying, the cacao failing to thrive where the shrinkage exceeded 10%. Studies made to elucidate the significance of this relationship are described in this report, including comparisons of the shrinkage of a number of soils with their moisture residues at permanent wilting and the percentage of moisture in the soil at the point of maximum plasticity. It was concluded that the amount of shrinkage exhibited by any soil is not determined solely by its colloidality or degree of dispersion but is dependent also on the degree of aggregation of the particles into compound grains. The poor condition of the cacao is therefore provisionally ascribed to the degree of diffusion of colloids and not merely to the colloidal content of the soils.—*T. D. Rice.*

258. Mason, T. G. **The physiological humidity of the soil and its direct determination.** West Indian Bull. 19: 137–154. 1922.—An outline is given of the more important methods which have been employed in the determination of the physiological moisture conditions of the soil. A simple method of measuring directly the water-supplying powers of soils by means of lead writing pencils has been described. Since soils at the time corresponding to the permanent wilting of plants rooted in them are all similar as far as their capacity to supply water to the plants is concerned, the values obtained by this method should show a close agreement. This was found to be the case in 7 soils of varying texture. A high degree of correlation was found to exist between the colloid content of the soils, as measured by the water of imbibition at the point of maximum plasticity, and the soil moisture residues at permanent wilting.—*Author's abstract.*

259. Miyake, Koji, Ishio Tamaehi, and Junjiro Konno. **The influence of phosphate, biphosphate, carbonate, silicate and sulfate of calcium, sodium and potassium on plant growth in acid mineral soils.** Soil Sci. 18: 279–309. *Pl. 1–7.* 1924.—The unproductiveness of acid soils is ascribed to the presence of soluble Al and to a deficiency of H_3PO_4. Therefore the application of chemicals that convert soluble Al into an insoluble state and which supply H_3PO_4 are considered the best means of improving acid soils. Barley in pot cultures responded favorably to additions of phosphate, biphosphate, carbonate and silicate in the order mentioned. Sulphate caused an unfavorable effect.—*C. G. Deuber.*

260. Morris, Vincent H. **The comparative effects of addition of nitrogen, phosphorus and potassium on the nitrogen economy of a Wooster silt loam soil.** Soil Sci. 18: 87–97. 1924. —A 5-year rotation of corn, oats, wheat, clover, and timothy for 30 years resulted in an in an average loss of 22% of the original supply of soil N, regardless of fertilizer treatment. Liming apparently had little effect on the average loss of N, the tendency during the last 10 years of the experiment being for the limed plots to lose N faster than the unlimed plots. Fertilizer treatments have resulted in a conservation of N directly proportional to the amount of increase in crop production due to the fertilizer treatment. Liming has increased the amount of N conserved by most fertilizer treatments.—*I. T. Scott.*

261. Morse, F. W. **The loss of calcium carbonate in drainage water as affected by different chemical fertilizers.** Soil Sci. 17: 249–254. 1924.—Drainage waters from plots used in fertilizer experiments were analyzed for Ca at different seasons of the year, 3 different combinations of chemical fertilizers having been used. Compared with $(NH_4)_2SO_4$ less than $\frac{1}{2}$ as much $CaCO_3$ was removed from soil when $NaNO_3$ was used as with the nitrogenous fertilizer. When $NaNO_3$ was added to applications of dissolved phosphate and KCl the loss of $CaCO_3$ was reduced.—*W. E. Maneval.*

262. Murray, J. Alan. **The available state.** Soil Sci. **17**: 359–371. *Fig. 1–2.* 1924.—The amount of available phosphoric acid in soils may be found from the rate at which the amounts of increase produced by application of different quantities of water-soluble phosphates diminish. The hypothesis offered to account for the phenomena observed is that ions are removed from the soil solution by growing plants and are replaced by the passing into solution of the most minute soil particles. The effect of the manure is to increase the number of these particles. When they are so numerous that the ions are replaced as rapidly as they are abstracted the maximum effect of the ingredient applied is produced and the crop will not be further increased by addition of any larger quantity.—*W. E. Maneval.*

263. Neidig, Ray E., and H. P. Magnuson. **Alkali Studies: I. Tolerance of wheat for alkali in Idaho soil.** Soil Sci. **18**: 449–467. *3 fig.* 1924.—Two successive crops of wheat, were grown in 4-gallon jars of soil containing various concentrations and combinations of alkali. The 1st crop of wheat was not affected by less than 0.1% recoverable Na_2CO_3, 0.2% recoverable NaCl or 0.75% Na_2SO_4 but 0.2% Na_2CO_3 or 0.25% NaCl was toxic. In combinations of 2 salts, if one approached its maximum concentration the other was sometimes injurious at low concentration and sometimes not. In the 2nd crop toxic effects of added alkali were in general overshadowed by stimulation.—*W. E. Maneval.*

264. Nemec, A., et K. Kvapil. **Sur la présence des nitrates dans les sols forestiers. [The presence of nitrates in forest soils.]** Compt. Rend. Acad. Sci. Paris. **180**: 1431–1433. 1925.—A series of determinations are given for forest soils supporting different floras.—*C. H. Farr.*

265. Niklas, H. **Das Wesen, die Bedeutung und die Bestimmungsmethoden der Bodenazidität. [The nature, significance and methods of determining soil acidity.]** Zeitschr. Pflanzenernähr. u. Düngung **4**: 232–233. 1925.

266. Nolte, O. **Das Wesen, die Bedeutung und die Bestimmungsmethoden der Bodenazidität. [The nature, significance and methods of determining soil acidity.]** Zeitschr. Pflanzenernähr. u. Düngung 4: 234. 1925.

267. Pfaffenberger, Walter. **Die festigkeit des getreidehalmes unter dem einfluss verschiedener düngung. [The hardening of grain stalks as influenced by various fertilizers.]** *31 p.* Giessen, 1922.—This paper gives the results of experiments to determine the effect of different fertilizers on the strength of stalks. An apparatus was devised to measure the amount of force required to break the stalks and a large number of rye and barley stalks of the same diameters grown with different fertilizers were tested. It was found that phosphoric acid gave the greatest strength to the stalks. Lime and potash gave less strength and KNO_3 gave the least. Liming gave the stalks a slightly increased flexibility.—*T. D. Rice.*

268. Post, Arthur H. **Soil variability as determined by statistical methods.** Soil Sci. **17**: 343–357. *Fig. 1–4.* 1924.—An attempt was made to determine variability of N in 2 different plots of soil at the Washington [State] Exp. Sta. It was found that apparently fairly uniform plots may vary greatly in N content of different samples. On account of variability of soil it is pointed out that the statistical constants for one area will not apply to any other. Single samples have little value and a composite sample is of value only after determination of the variability, using numerous samples.—*W. E. Maneval.*

269. Ramann, E. **Das Wesen, die Bedeutung und die Bestimmungsmethoden der Bodenazidität. [The nature, significance and methods of determining soil acidity.]** Zeitschr. Pflanzenernähr. u. Düngung 4: 217–221. 1925.—A discussion.—*F. M. Schertz.*

270. Ramann, E. **The chemico-physical influences of quick lime and calcium carbonates on mineral soils.** (Translated from the German by N. Morgendorff and J. S. Joffe, New Jersey Agric. Exp. Sta.) **Soil Sci. 18**: 387–100. 1924.—Since native soils are of complex composition, finely granulated quartz was used in the experiments as a representative of a common constituent, chemically almost inactive. The summarized details are to be published later. The main points studied were adsorption by quartz, exchange of bases, acids and acid-reacting solutions, and liming with calcium carbonate.—*W. E. Maneval.*

271. Rimann, C. **Humunit, das neue Kultur- und Düngungsmittel. [Humunit, the new fertilizer.]** Gartenwelt **28**: 38. 1924.—Humunit is composed of non-acid, very fine peat, which contains an abundance of soil bacteria. When used as a manure it gave a better de-

velopment to plants than those which were not treated. It may be applied to the soil in the fall by a shallow turning of the earth. In a few days the results are apparent. Examples are given of different vegetables, flowering plants, ornamentals, sugar beets, alfalfa, wheat and mushrooms. An increase of 30% in harvest over non-treated fields is recorded; small quantities are reported to give results. Humunit can be kept about ½ year in places free of frost. The upper surface should not be allowed to dry out but must be kept wet.—*J. C. Th. Uphof.*

272. Runk, C. R. **Hydrogen-ion concentration, buffer action and soil type as a guide to the use of lime.** Jour. Amer. Soc. Agron. 17: 345–353. 1925.—Applications of lime, made by the "lime requirement" method, upon the Delaware Experiment Station fertility plots have in most instances shown no profits. However, increases in production were secured and it is felt that smaller applications based upon H-ion concentration and plant needs would have been economical. More work needs to be done upon the optimum pH values for crops under field conditions, but the present indications are that most of these values may fall between pH 4 and pH 6.—*F. M. Schertz.*

273. Salter, R. M. **Climatic agencies in their relation to soil colloids.** Jour. Amer. Soc. Agron. 17: 294–307. 1925.—The paper is concerned with the results of changes in state of soil colloids, that is, the reciprocal changes of sols to gels and the changes which occur in the structure of gels. These changes are associated with drying and wetting, freezing and thawing and change in concentration of the ions of dissolved electrolytes.—*F. M. Schertz.*

274. Schomerus. **Rhenania-phosphat.** Gartenwelt 28: 353. 1924.—Rhenania-phosphate is manufactured in the Rheniana Chemical Works, Aix-la-Chapelle, after the patent of Messerschmitt. It resembles Thomas phosphate, but is lighter, and contains 14–20% phosphoric acid and 2–3% potash. It is recommended for fruit growing.—*J. C. Th. Uphof.*

275. Shim, Edward. **Report of a fertilizer survey in the mulberry districts of Kwangtung.** Lingnaam Agric. Rev. 2^2: 79–89. 1925.—The importance of the mulberry in the silk districts of Kwangtung led to a general though hurried survey of the materials used for fertilizer. It was found that night soil and peanut cake are very commonly used with good results. Less common fertilizers are bean cake, hog manure, pond and canal mud, soil from old walls which had apparently absorbed nitrates, refuse from silk worm feeding, feathers, rubbish and garbage. The most common commercial fertilizer used is $(NH_4)_2SO_4$ which was introduced about 1910. It increases the yield but an undesirable acid residue accumulates, which can be corrected by the addition of lime. Chile Saltpeter ($NaNO_3$) and KNO_3 are also used, but only to a limited extent due to their rapid liquification in the humid climate. The desirability of using non-decomposed night soil is questioned from an economic standpoint, because of the presence of hookworm eggs and larvae. Six samples of soil taken from around mulberry trees where night soil had been added within a week showed the presence of larvae as follows: 150, 32, 241, 138, 195 and 341, respectively. It is very easy for these larvae to enter the body through the feet and hands of the laborers.—*R. H. Porter.*

276. Smith, Raymond S. **Experiments with subsoiling, deep tilling, and subsoil dynamiting.** Illinois Agric. Exp. Sta. Bull. 258. *155–170. Fig. 1–6.* 1925.—Data are presented to show that neither subsoiling, deep tilling, nor subsoil dynamiting can be depended upon to increase crop yields on Illinois soils. The cost of deep tillage is prohibitive unless such practice would increase the yields very greatly. In the soils used in the experiment.—Gray Silt Loam on Tight Clay, and Brown Silt Loam—none of these tillage treatments improved the downward movement of moisture through the soil.—*H. A. Lunt.*

277. Smolik, Ladislas. **Échange de l'ion aluminium des sols de divers types contre l'ion potassium d'un sel neutre.** [**The exchange of aluminium in soils of diverse types for the potassium ion of a neutral salt.**] Compt. Rend. Acad. Sci. Paris 180: 1773–1776. 1925.

278. Starkey, Robert L. **Some observations on the decomposition of organic matter in soils.** Soil Sci. 17: 293–314. *Fig. 1–5.* 1924.—The writer considers the amount of CO_2 evolved a very satisfactory index of the amount of organic matter decomposed in the soil. He studied decomposition of cellulose, alfalfa meal, rye straw, etc., in different soils. The rate of decomposition varied with fertility of the soil, kind of material being decomposed, time elapsed since beginning of the experiment, reaction and sometimes with concentration of nitrates.—*W. E. Maneval.*

279. Stephenson, R. E., and W. L. Powers. **Influence of sulfur oxidation on solubility of soil minerals.** Soil Sci. 18: 317–321. 1924.—The oxidation of S applied to 2 Oregon soils caused a decided increase in the water soluble Ca and K but reduced the amount of water soluble P. Even the lighter applications produced an increase in acidity.—*C. G. Deuber.*

280. Swanson, C. O., P. L. Gainey, and W. L. Latshaw. **The calcium content of soil in relation to absolute reaction.** Soil Sci. 17: 181–191. 1924.—Samples of soils from various counties in Kansas and from 24 other states were analyzed for Ca soluble in cold N/1 HCl. A close correlation was found between the Ca content and the pH values of soils of similar physical texture and collected under similar climatic conditions; generally, the higher the pH number, the higher the Ca content.—*W. E. Maneval.*

281. Tacke, B. **Das Wesen, die Beudeutung und die Bestimmungsmethoden der Bodenaziditat.** [**The nature, significance and methods of determining soil acidity.**] Zeitschr. Pflanzenernähr. u. Düngung 4: 215–216. 1925.—Eleven soils were analyzed by the Daikuhara and the Moor Exp. Sta. methods, for their CO_2 content.—*F. M. Schertz.*

282. Taylor, E. McKenzie, and A. Chamley Burns. **Preliminary note on the soil temperature in sharâqi land.** Ministry Agric. Egypt. Tech. & Sci. Serv. Bull. 34. *1–12. 20 pl.* 1924.—A preliminary report of the soil temperatures is given in this paper for the purpose of obtaining information about soil conditions during the "sharâqi" period, the term referring to the months of May, June and a portion of July during which the land receives no irrigation water. The data collected were intended for use in a study of the effect of high temperature on the sterilization of the soil. The factors which influence the heating and cooling of the soils are discussed. Soil isotherms were plotted and their value in a study of soil sterilization is shown.—*T. D. Rice.*

283. Taylor, E. McKenzie, and A. Chamley Burns. **Soil temperatures during the sharâqi period and their agricultural significance.** Ministry Agric. Egypt Tech. & Sci. Serv. Bull. 31. *1–46. 6 pl.* 1924.—This paper gives the results of studies to determine whether the temperatures which the soil attained during the "sharâqi" period were high enough to effect partial sterilization. The term "sharâqi" is used for the rest period including the months of May, June and a portion of July during which the land receives no irrigation water. The soil temperatures at various depths recorded during the sharâqi period of 1922 led to the conclusion that partial sterilization can be effected to a depth of 5 cm. The application of these records to agricultural practices is dealt with and it is suggested that the tillage of sharâqi lands will intensify the sharâqi effect. The postponement of the sowing of maize is suggested as a means of lengthening the sharâqi period. The means at which the maximum effect of the sharâqi period can be obtained is discussed.—*T. D. Rice.*

284. Thomas, M. D. **Aqueous vapor pressure of soils. II. Studies in dry soils.** Soil Sci. 17: 1–18. *Fig. 1–3.* 1924.—The vapor- pressure-moisture curves of a series of soils at comparatively low moisture contents were determined with special reference to the influence of wetting and drying the soils. Drying was found to be particularly effective in raising the vapor pressure at a given moisture content. This effect was reversed by protracted contact with moderate amounts of water or shorter contact with excess of water. The author is of the opinion that the data confirm the theory of the colloid-coated particle.—*C. G. Deuber.*

285. Tidmore, J. W., and F. W. Parker. **Methods of studying the strength of soil acids.** Soil Sci. 18: 331–338. 1924.—The strength of the acids in 25 soils was determined by the Truog acidity method, the sugar inversion method and by the H-ion concentration; the last 2 methods were modified so that the same amount of acid was used in the determination for all soils. The results of the 3 methods correlate well and this is taken as an indication that the H-ion concentration of the soil solution is largely determined by the acidity of the acid silicates of the soil. The presence of acid soil greatly increased the rate of sugar hydrolysis when the specific resistance and H-ion concentration of soil suspensions were constant. The influence of the solid phase is explained by Donnan's theory of membrane equilibria.—*C. G. Deuber.*

286. [Tiulin, A. F.] Тюлин, А. Ф. **Вредное действие высоких доз извести на подзолистых почвах. В связи с особым характером Биологическіх процессов в них.** [**The injurious effect of excessive liming on podsol soils, in connection with the peculiar character of the biological processes taking place in such soils.** Труды Научного Института

по Удобрениям Выпуск. [Trans. Inst. Fertilizers] 26. *1–43*. S. S. S. R.: Moscow, 1925.—In order to determine the causes for the injurious action of excessive doses of lime, a series of vegetation experiments were conducted with a light loam soil lacking in bases, a medium loam soil also unsaturated with bases but containing more silt, and a heavy loam soil lacking in bases only to a limited extent. Lime was added in the form of $CaCO_3$; the products determined were NH_3, nitrates, nitrites, water-soluble humus, water soluble Ca and H-ion concentration. Clover, mustard and vetch were grown in the pots containing the lime-treated soils and the drainage waters removed for analysis through an opening at the bottom covered with an asbestos disc. The influence of NH_4 salts upon plant growth, with and without 1% of lime was also studied. Where lime was found to have an injurious effect, an attempt was made to balance this effect by addition of salts of potassium and sodium. The results can be summarized as follows: (1) Of the 3 soils tested, an injurious effect upon crop yield due to the application of 1% $CaCO_3$ has been noted only in the case of the light sandy loam soil; on heavier soils the same proportion of lime did not cause any injury.—(2) Biological processes were much more active in the light soil with 1% of lime, than in a heavy one. The analysis of the light soil in its 1st stage (the first 2–3 weeks) showed a considerable accumulation of NH_3, nitrites, nitrates, water-soluble humus, and water-soluble Ca; in other soils, where no injurious effect was ascertained, liming did not bring about any marked increase in the amount of these products.—(3) A highly alkaline reaction (pH 7.8) was found not only in the light soil with 1% of lime, where ill effects were observed, but also in the medium loam soil with the same amount of lime, where no injurious effect was produced. Thus, a given alkalinity does not in itself cause the injury.—(4) By increasing the concentration of NH_3 in the soils receiving 1% of lime by adding 0.1% and even 0.15% of NH_4Cl, the growth of the plants was retarded. Thus the presence of NH_3 was found to be of great importance with a given amount of alkalinity. Ammonium salts alone did not act injuriously upon the growth of plants in neutral or slightly acid soils, but rather increased the yield.—(5) Soils with retarded plants were washed at different times. The growth was improved when the washing took place during the 2nd and 3rd week after the application of lime. This special period is to be characterized by a most active accumulation of NH_3, which was thus removed by washing at the proper time. An earlier washing (1st week) or a later one (after the lapse of 4 weeks) could not rectify the injurious effect.—(6) The results obtained from the experiments on planting the seed after a lapse of 4 weeks from the beginning of the experiment, namely in that period, when the total amount of NH_3 and of nitrites were already transformed into nitrates, were in accordance with the results of the experiments with washing. This 2nd sowing of clover, made in the light soil receiving 1% of lime at a later period, did not exhibit any signs of reduced growth of crop while the 1st sowing (made at the beginning of the experiment) has shown a marked decrease in the yield.—(7) The addition of bicarbonates of K and Na balanced the injurious effect of 1% of lime when the total amount of these salts did not exceed 0.05%.—(8) Small quantities of lime, not exceeding 0.2%, did not bring about any decrease of crop yield in the same light soil, in which reduced growth of plants after the application of 1% of lime was ascertained. The products of biological processes, especially NH_3, were found to be much smaller in this case than with excessive liming.—(9) The accumulation of nitrites, noted in 1922 in the case of marked retardation of plant growth brought about by excessive liming, was not recorded in 1923, when the decrease in crop yield was also less marked than in the previous year.—(10). Different kinds of plants do not exhibit the same degree of sensitiveness to the injurious effect of excessive liming. This sensitiveness is also dependent upon the age of the plant, being very great in the early stages of growth and becoming less pronounced during the more advanced period of its life.—*S. A. Waksman.*

287. Truog, E. **The significance of soil colloids in relation to plant feeding and conservation of essential elements.** Jour. Amer. Soc. Agron. **17**: 280–285. 1925.—Soil colloids immediately remove an excess of the essential elements from the soil solution after fertilization and prevent leaching. The essential elements are not readily removed from colloids by drainage water because the water passes through the larger pores between the granules and not through the pores of the colloidal gels. Root hairs of plants come into very close contact with the gels and form a sort of colloidal union with them which makes possible a removal of the

soluble elements in the water of the gel. Sandy soils, due to their low content of colloidal material, leach very readily.—*F. M. Schertz.*

288. Tschermak, Leo. **Alpenhumus (das Gesetz seiner Bildung). [Alpine humus—the reason for its formation.]** Centralbl. Gesam. Forstw. **47**: 65–75. 1921.—The formation of thick layers of fertile leaf mold instead of raw humus in the Alps and other mountain regions of the warmer portions of the temperate zone, is attributed to temperature and moisture conditions which favor the decomposition of vegetable matter during the growing season. The long period under snow cover prevents entire decomposition of the humus such as happens in the lowlands at similar latitudes.—*W. N. Sparhawk.*

289. Tulaikov, N., and M. Kuzmin. **Abstracts of some papers on soils and plant physiology presented or published in 1923.** (Translated by J. S. Joffe.) Soil Sci. **17**: 423–438. 1924.—Abstracts of the following papers presented at a convention of Russian investigators in soil science and geo-botany at Moscow, September 1923, are given: A. F. Lebedjev, On the moisture properties of the soil; D. G. Vilensky, Origin of alkali soils; D. G. Vilensky, On the ameliorization of salinized soils; B. G. Kornev, The absorbing power of soils and the principle of automatic self-irrigation of soils; G. A. Katshinsky, The root system of grasses in soils of the podzol type; V. V. Hemmerling, The characterization of the main soil types from data of absorded bases; A. A. Krasink, The differentiation of podzol soils by morphological indices.—A number of papers on soil physics and chemistry published in German publications since 1923 are discussed. Abstracts of the following papers are given: F. C. Gerretsen, Investigations on nitrification and denitrification in tropical soils, Arch. Suikerindust. Nederland. Indië **29**: 1397–1530, 1921; F. C. Gerretsen, A. Gryns, J. Sack, and N. L. Söhngen, On the occurrence of a bacteriophage in the nodules of leguminous plants, Centralbl. Bakt. Abt. 2, **60**: 311.; D. J. Hissink and K. Zylstra, Report on the investigation on the causes of the poor appearance of some crops in Zeeland, Verslag. Landbouwk. Onderzoek, Rijkslandbouwproefsta. **27**: 1–12, 1922; D. J. Hissink, Studies on samples of soil and dredged mud from the polders and lakes east of the Utrechste Vecht in connection with the drainage plans of these lakes. Internat. Mitteil. Bodenk **11**: 166–183; Chr. Brockmann and D. J. Hissink, The black clay of Thesinge (in the province of Groningen, Holland), Verhandl. Geol.-Mynbounk. Genootsch. Nederland Kolon., Geol. Ser. **6**: 43–55; D. J. Hissink, A simple and quick method for determining soil acidity, Chem. Weekbl. **19**: 281–283, 1922; D. J. Hissink, Some general conceptions on acidity and the role played by it in several processes, Verslag. Landbouwk. Onderzoek. Rikslandbouwproefsta. **27**: 133–145, 1922; D. J. Hissink and Jac. van der Spek, The acidity of the soil, Ibid. **27**: 146–161, 1922; Jac. van der Spek, The action of solutions of neutral salts on soil: A contribution to the knowledge of soil acidity, Ibid. **27**: 162–202, 1922; J. Hudig and C. Meyer, The influence of acid and alkaline fertilizers on the growth of crops (Six years of practical experience on the plots of Spitsberger), Ibid. **26**: 60–68, 1922; H. M. Quanjer and J. Hudig, The potato scab in its relation to climate and soil (see Bot. Absts. 12, Entry 4350); J. F. Lichtenberg, Soil water level, capillarity and evaporation, Cultura **34**: 262–270, 1922; J. G. Maschhaupt, The influence of soil type and fertilization on the nitrogen and ash contents of our farm crops, Verslag. Landbouwk. Onderzoek. Rijkslandbouwproefsta. **27**: and **28**: 1922 and 1923.—*W. J. Robbins.*

290. Turrentine, J. W. **Potash readily obtainable from American sources.** Manufacturers Record 87^{17}: 69–70. 1925.—The importance of the American potash problem is emphasized by showing that of the 250,000 tons of potash (K_2O) used annually in American agriculture, 90% is still imported from Europe. American resources in potash represented by mineral and saline deposits and industrial wastes contain inexhaustible supplies but await more efficient methods of recovery before being placed under adequate exploitation. The blast furnace industry, in which there is now an annual loss of 84,000 tons K_2O in the wet-washing of blast-furnace gases, is used as an illustration. It is shown how this great quantity of available potash can be conserved and increased with concurrent economies of great value.—*Author.*

291. Vandecaveye, S. C. **The replacement of soil potassium.** Soil Sci. **17**: 91–96. 1924.—The replaceable K in sterile and non-sterile soil treated with applications of clover hay

and manure was studied. About 90% of the absolute K of Carrington loam was replaced by 2 extractions with N/1 NH_4Cl. Applications of organic matter resulted in the liberation of considerable quantities of replaceable K from the soil. This liberation increased proportionally to the increased amounts of organic matter applied. The liberation of replaceable K appeared to be largely a chemical process which seemed to proceed in the absence of biological factors.—*C. G. Deuber.*

292. Viljoen, J. A., and E. B. Fred. **The effect of different kinds of wood and of wood pulp cellulose on plant growth.** Soil Sci. **17**: 199–208. *Pl. 1–3.* 1924.—The unfavorable action of wood in the soil on plant growth (oats and red clover) results from lack of nitrate caused, no doubt, by increased assimilation of nitrates by microörganisms. Essential oils, resins and tannins of the wood in the amount present seemed to have no appreciable harmful effect. Loss of nitrate is due to reduction caused directly or indirectly by cellulose-destroying organisms. Generally after a year injurious effects of wood in soil disappear.—*W. E. Maneval.*

293. Vincent, V. **Action des carbonates alcalins et alcalino-terreux sur l'acidité des sols. [The action of alkaline carbonates and alkaline earths on the acidity of the soil.]** Compt. Rend. Acad. Sci. Paris **180**: 586–588. 1925.—It is found that some plants, such as the trefoil, leave the soil more acid than others such as wheat. It is concluded that $CaCO_3$ is the best insoluble neutralizing agent.—*C. H. Farr.*

294. Waksman, Selman A., and O. Heukelekian. **Microbiological analysis of soil as an index of soil fertility: VIII. Decomposition of cellulose.** Soil Sci. **17**: 275–291. *Fig. 1.* 1924.—The cellulose-decomposing power of a soil may indicate the content of available N as well as the microbial condition of the soil. Three methods of determining the cellulose-decomposing power of soils are recommended and described. These methods yield information, respectively, concerning available N, microbial activity, and N that may become available after certain chemical treatments of the soil.—*W. E. Maneval.*

295. Waksman, Selman A., and P. D. Karunaker. **Microbiological analysis of soil as an index of soil fertility. IX. Nitrogen fixation and mannite decomposition.** Soil Sci. **17**: 379–393. *Fig. 1–3.* 1924.—Fixation of N in soil in the presence of an available carbohydrate like mannite depends on several conditions such as composition, physical condition, reaction and the microörganisms of the soil. The N fixing capacity of a soil indicates to some extent the N fixing flora of the soil, while the mannite-decomposing power serves as an index of available phosphate in the soil.—*W. E. Maneval.*

296. Waksman, Selman A., and Robert L. Starkey. **Influence of organic matter upon the development of fungi, Actinomycetes and bacteria in the soil.** Soil Sci. **17**: 373–378. 1924.—Observations were made on the effect of adding dextrose, cellulose, rye straw, alfalfa meal and dried blood to soil. The number of microörganisms was determined by the plate method after 10–17 days incubation. The addition of any 1 of the materials mentioned caused an increase in number of microörganisms in the soil, but some caused more increase than others, especially of certain groups of organisms. Additions of dried blood, alfalfa and straw increased the number of microörganisms in the order named, the 1st being most efficient.—*W. E. Maneval.*

297. Waksman, S. A., and R. L. Starkey. **Microbiological analysis of soil as an index of soil fertility: VII. Carbon dioxide evolution.** Soil Sci. **17**: 141–161. *Fig. 1–4.* 1924.—Two methods for measuring the capacity of soils to produce CO_2 are described: (1) Determining the amount of CO_2 formed from 1 kgm. of fresh soil for 14 days; (2) determining the amount of CO_2 produced from 500 mgm. of dextrose added to 100 gm. of fresh soil in 48 hours. Soils rich in organic matter produce the greatest amount of CO_2 but the CO_2 produced is not proportional to the C content of the soils. Addition of lime to an acid soil stimulates the production of CO_2, but not to as great an extent as nitrification.—*C. G. Deuber.*

298. Weir, Walter W. **Ground water fluctuations at Kearney Park, California.** Hilgardia **1**: 133–144. *Fig. 1–5.* 1925.—Tables are given showing the depth to water in 21 test wells placed in an area of 7000 acres at Kearney Park. The records were taken weekly for 8 out of the 11 years, 1912–1922. The seasonal fluctuation of the water table was between 5 and 6 feet. The most rapid rise occurred in March and April when irrigation began, the highest level is reached in June, and the low point comes in December. The author discusses the value of such data when drainage systems are being planned.—*Margaret Buvens.*

299. White, J. W., and F. J. Holben. **Residual effects of forty years continuous manurial treatments. I. Effect of lime on decomposition of soil organic matter.** Soil Sci. **18**: 201–217. *Pl. 1, fig. 1.* 1924.—No significant difference was found in the action of burned lime and limestone on soil organic matter at the end of 40 years of continuous treatment. Both the limestone and burned lime treated soils show a significant increase of N above that found on untreated soil. Burned or caustic lime does not have a destructive action on soil organic matter in excess of such action by lime carbonate; in fact, both forms of lime conserved N and organic matter as compared to the untreated soil.—*C. G. Deuber.*

300. Wijk, D. J. R. van. **The quantitative determination of nitrates in soil.** Soil Sci. **17**: 163–179. 1924.—The methods for determining nitrates in soils are reviewed and a modification of the aluminum reduction method is described.—*C. G. Deuber.*

301. Winogradsky, S. **Sur une méthode pour apprécier le pouvoir fixateur de l'azote dans les terres. [A method for ascertaining the nitrogen fixing power of the soil.]** Compt. Rend. Acad. Sci. Paris **180**: 711–716. 1925.—The inadequacy of the 3 standard methods is discussed. A new method is proposed, which permits one to determine the presence or absence of *Azotobacter* in the soil, their density and the yield of fixed N corresponding to their rate of multiplication. The method involves potassium silicate plates containing a nutrient salt.—*C. H. Farr.*

302. Wolkoff, M. I. **Effect of iron and aluminum salts on the phosphorus recovery from soils and quartz sand treated with Tennessee rock or double acid phosphate.** Soil Sci. **18**: 469–478. *1 fig.* 1924.—After applications of rock phosphate or of double acid phosphate the recovery of P from different soils varied greatly. The effect on P recovery of adding ferric and aluminum chlorides to some soils and to sand treated with phosphatic fertilizers, was studied. It was found that addition of $FeCl_3$ to 3 soils, given one or the other of the 2 phosphate treatments, caused a decrease in recoverable P, while application of $AlCl_3$ to the same soils resulted in no loss or even an increase in P recovery. Applications of $CaCO_3$, $FeCl_3$ or $AlCl_3$ to fine silica flour treated with rock phosphate did not affect P recovery, but addition of various mixtures of these chemicals decreased P recovery. The author suggests that in the latter case double salts of phosphates, less soluble than single salts, may be formed.—*W. E. Maneval.*

303. Wolkoff, M. I. **Notes on a method for the determination of sulfur in soil.** Soil Sci. **18**: 371–377. 1924.—A modification of Olson's method as used at the Washington [State] Exp. Sta. has been used successfully at the Illinois Exp. Sta. for 3 years and is described here. It is a short method and is claimed to be very satisfactory.—*W. E. Maneval.*

304. Wolkoff, M. I. **Relative availability of the phosphorus of raw rock and acid phosphate in soils.** Soil Sci. **17**: 39–56. *Fig. 1–5.* 1924.—Mineral soils greatly depressed the solubility of P applied in the form of phosphatic fertilizers. A peat soil did not. After phosphatic fertilizers were applied to soils, the recovery of P from soil treated with double acid phosphate was no greater than the recovery of P from the same soil treated with ground rock phosphate; nitric acid was used as the solvent. Treating the soil with $(NH_4)_2SO_4$ and $CaSO_4$ increased the P recovery very considerably while $CaCO_3$ in large amounts inhibited P recovery.—*C. G. Deuber.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

Carroll W. Dodge, *Editor*
Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 123, 289, 338, 343, 344, 542, 907)

305. Anonymous. **Geheimer Oberforstrat Professor Xaver G. Siefert.** Centralbl. Gesam. Forstw. **47**: 100–101. 1921.—Siefert (Jan. 14, 1849–Nov. 9, 1920) was professor of forestry at Karlsruhe Technical College from 1895 to 1920, and director of the Forest Exp. Sta. of Baden. He conducted various investigations on silviculture and forest soils, and founded the forest soils laboratory at Karlsruhe (now part of the Forest Research Institute at Freiburg).—*W. N. Sparhawk.*

306. Anonymous. **H. Copijn.** Gartenwelt **28**: 8. 1924.—H. Copijn was a prominent dendrologist and garden architect in the Netherlands. He died after an operation when 81 years old, in 1923.—*J. C. Th. Uphof.*

307. Anonymous. **Révue bibliographique.** Bull. Soc. Bot. France **71**: 1246–1306. 1924. —This review, published with the aid of funds appropriated by Parliament, appears periodically in the Bulletin. Titles are classified as follows: Flora of France, European floras, taxonomy, paleobotany, ontogeny, morphology, cytology, apparatus and technical methods, physiology, genetics, hybridity, plant chemistry, dendrology, mosses, algae, lichens, fungi, phytopathology, biography, history of botany, applied botany.—*J. Beauverie (translated).*

308. Anonymous. **The centenary of Huxley.** Nature **115**: 698–752. 1925.—This is a supplement to the issue of May 9, containing 7 portraits and 25 articles including: (1) Thistleton-Dyer, W. T. Plant biology in the 'seventies. *P. 709–712.* (2) Bower, F. O. Teaching of biological science. *P. 712–714.* (3) Vines, S. H. The beginnings of instruction in general biology. *P. 714–715.* (4) Bateson, W. Huxley and evolution. *P. 715–717.* (5) Thomson, J. Arthur. Huxley as evolutionist. *P. 717–718.—O. A. Stevens.*

309. Anonymous. **The greatness of Galton.** [Rev. of: Pearson, Karl. **The life, letters and labours of Francis Galton. (1) Birth 1822 to marriage 1853.** *xxiv + 246 p. 66 pl.* **(2) Researches of middle life.** *xii + 425 p. 54 pl.* Univ. Press: Cambridge, 1914–1924.] Nature **115**: 631–634. 1925.—This includes a readable account of all of the more important contributions that Galton made to science, and this is of inestimable value, for the papers are widely scattered and many are not accessible. (See also Bot. Absts. 12, Entry 2286.)—*O. A. Stevens.*

310. Bateson, W. **Mendeliana.** [Rev. of: (1) Correns, Carl: **Gesammelte Abhandlungen zur Vererbungswissenschaft aus periodischen Schriften 1899–1924. (Collected papers of Carl Correns on heredity from periodicals.)** *ix + 1299 p. 4 pl.* Julius Springer; Berlin, 1924. (2) Iltis, Hugo. **Gregor Johann Mendel: Leben, Werk und Wirkung. (Life and work of Mendel).** *viii + 426 p. 12 pl.* Julius Springer; Berlin, 1924.] Nature **115**: 827–830. 1925.

311. Bessey, Ernst A. **William James Beal: an American pioneer in science.** Science **61**: 559–560. 1925.—The life and works of this student of Gray, Eliot and Louis Agassiz are briefly portrayed. Beal was among the first to use the laboratory method of instruction in botany and early gave attention to the problems of forestry. He died on May 12, 1924.—*C. J. Lyon.*

312. Borza, Al., et E. Pop. **Bibliographia botanica Romaniae.** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **3**: 99–101, 1923; **4**: 26–30, 101–106, 1924; **5**: 46–48, 1925.

313. Brandza, M. **Gaston Bonnier.** Bull. Ştiinţe Nat. **26**[6]: 95–109. *Portrait, 1 fig.* (Publicaţiunile Societăţii Naturaliştilor din România Nr. 6) 1923.

314. Breitschwerdt, Hermann. **Victor Goebel.** Gartenwelt **28**: 292. 1924.—Victor Goebel was born in 1869 in Münsterberg, Germany, and died in Vienna in 1924. He was a prominent landscape architect.—*J. C. Th. Uphof.*

315. Campbell, Douglas Houghton. **The centenary of Wilhelm Hofmeister.** Science **62**: 127–128. 1925.—Mention is made of the important works of Hofmeister, chiefly on the morphology of the archegoniate plants.—*C. J. Lyon.*

316. Eliot, Charles W. **The laboratory method in the teaching of botany.** Science **61**: 609–610. 1925.—It is claimed from the writer's knowledge of the facts that the laboratory method in botany was used many years before W. J. Beal was said to have introduced it as stated by Bessey in a recent article (see this issue, Entry 311).—*C. J. Lyon.*

317. Friend, Hilderic. **Garden craft in the Canticles.** Gard. Chron. [London] Ser. III. **75**: 318, 360; **76**: 130–131, 166, 234–235, 268, 318–319, 354–355, 406, 436. 1924.—Hebrew names are given for garden plants and terms with references to the canticles and the Bible.—*P. L. Ricker.*

318. Hunger, F. W. T. **Jan of (or) Johannes Commelijn (Joannes Commelinus) 1629–1692.** Nederland. Kruidk. Arch. **1924**: 187–202. *3 fig.* 1925.—Various authors usually claim that Johannes Commelijn was medicus and professor of botany at the Athenaeum Illustre in Amsterdam, this, however, is an error. From original archives the writer shows that he was a druggist and a merchant. He was not born in Amsterdam but in Leiden, April 23, 1629.

When 12 years old he went to Amsterdam. He was the author of Nederlantze Hesperides (1676). A bibliography of 12 titles is appended.—*J. C. Th. Uphof.*

319. Jackson, B. Daydon. **Botanical illustration from the invention of printing to the present day.** Jour. Roy. Hort. Soc. **49**: 167–177. 1924.—There are 3 main methods of producing representation of plants: wood engraving, copper plate printing, and lithography. Wood engraving was used as early as 1475 by Konrad v. Megenberg and increased rapidly after 1542, but by 1640 it had begun to deteriorate. There was, however, a great revival towards the middle of the 18th century.—We find 36 plates etched on copper in Fabio Colonna's "Phytobasanos," of 1592. Copper plates did not supersede wood blocks but continued in use until well into the 19th century. Several modifications of copper plate engraving are briefly described. Lithography was first applied by Alois Senefelder (1798), using a special limestone from Bavaria. –The process of Henry Bradbury ("nature-printing, 1855") had limited usefulness for a time. Specimens of a fern or other plant were placed between a sheet of steel and one of lead and hydraulic pressure applied, with the result that the plant was pressed into the lead plate which was then electrotyped. Certain modifications of this process are described. Brief descriptions of the development of the modern line process, the photogravure, and the "three colour" half tone process are given.—*J. K. Shaw.*

320. Jackson, B. Daydon. **The history of the compilation of the "Index Kewensis."** Jour. Roy. Hort. Soc. **49**: 224–229. 1924.—This is a detailed account of the methods used in the compilation of the index, of which Jackson was editor. The work was begun Feb. 3, 1882, and publication was completed in 1895. For the first 7 years it was financed by a gift from Charles Darwin. A committee, on which J. D. Hooker, Daniel Oliver, John Ball, and W. B. Hemsley served, aided in the work. A bibliography is appended.—*C. A. Weatherby.*

321. Keith, M. Helen. **A bibliography of researches bearing on the composition and nutritive value of corn and corn products.** Illinois Agric. Exp. Sta. Bull. 257. *1–151.* 1925.—This is an extensive bibliography made up of 3 sections: (1) Author bibliography, (2) subject bibliography, and (3) selected books, pamphlets, and general articles.—*H. A. Lunt.*

322. Larsen Th. **Oversigt over fremmed Litteratur for Aar 1921.** [**Review of foreign literature of 1921.**] Tidsskr. Planteavl. **30**[4]: 655–702. 1924.—A compilation of several hundred titles of important publications along agricultural lines that appeared during 1921.—*Albert A. Hansen.*

323. Lecomte, H. **Notice sur M. Edouard Bureau.** Bull. Soc. Bot. France **71**: 1028–1041. *Pl. 1–8. Portrait.* 1924.—Bureau (1830–1918) held for 32 years the chair of systematic botany at the Paris Museum. He was 4 times President of the Société Botanique de France. A list of his botanical and paleobotanical publications is appended.—*J. Beauverie (translated).*

324. Lecomte, H. **Notice sur S. A. le Prince Roland Bonaparte.** Bull. Soc. Bot. France **71**: 1041–1047. *Pl. 1–9. Portrait.* 1924.—Prince Roland Bonaparte (1858–1924) was a grandson of Lucien Bonaparte, 2nd brother of Napoleon I. At first a geographer and traveller, he was led thereby to the sciences of geology, anthropology, and botany. His large botanical collections (at the time of his death they filled 10,718 boxes) had been for the most part acquired since 1900. He secured important herbaria, especially that of Rouy, author of the "Flore de France." It was his purpose to bring together an herbarium of the flora of the entire world; while his collaborators pursued this task, he himself specialized in ferns. This part of his collection included the herbaria of Christ and Luerssen. Since 1915 he had issued occasional "Notes ptéridologiques," and had published other botanical works. He was a member of the Institut de France and had been President of the Société Botanique de France. His fern herbarium has been given to the Museum of Natural History at Paris; his general herbarium to the University of Lyons.—*J. Beauverie (translated).*

325. Loder, G. W. E. **Anthony Waterer.** Rhododendron Soc. Notes **2**: 252–254. 1925.—A short biographical sketch of the prominent English nurseryman, Anthony Waterer, chiefly known for the development of numerous hybrids and forms of Rhododendron and Azalea.—*Alfred Rehder.*

326. Prain, David. **Government botanical gardens.** Gard. Chron. [London] Ser. III. **77**: 39, 62, 78, 109, 132–133. 1925.—The Sir George Birdwood Memorial lecture before the

Royal Society of Arts, Jan. 9, 1925. Many botanical gardens started as medicinal plant gardens. One of the earliest gardens of this type was started by Aristotle where Theophrastus was a student. Those of John Brancion at Flanders; of Cardinal Farnese at Rome; of the Burgomaster of Terneuzen, where Pastor Peter Hondius worked; and of John Goodyer at Hampshire were equal to those of the Universities of Padua, Leiden, Paris, Montpelier and Oxford. Those of the Dutch East and West Indies are also noted.—*P. L. Ricker.*

327. Robinson, B. L. **Asa Gray.** Science 62: 45–46. 1925.—This address at the unveiling of the Gray bust in the Hall of Fame May 21, 1925, reviews the principal events in the career of the famous botanist.—*C. J. Lyon.*

328. Savage, S. **Plant-lore in an old Latin dictionary.** Gard. Chron. [London] Ser. III. 75: 304. 1924.—Notes are given on plant lore from a dictionary published in London in 1552 and printed by Thomas Berthalet.—*P. L. Ricker.*

329. S[chaeffer], A. **Une Carrière Forestière Mouvementée. [An active forest career.]** Bull. Trimest. Soc. Forest. Franche Comté et des provinces de l'Est 16: 53–55. 1925.—An account of the forest career of Chevalier Noiret, in the early part of the 19th century.—*J. Kittredge, Jr.*

330. Seelhorst, Wilhelm von. **Hubert Jakob Esser.** Jour. Landw. 73: 1–5. 1925.—An obituary.—*F. M. Schertz.*

331. Stomps, Theo. J. **In memoriam A. C. J. van Goor.** Nederland. Kruidk. Arch. 1924: 238–244. 1925.—A. C. J. van Goor, a Dutch botanist, died in 1924 at 43 years of age. He was a distinguished algologist and did much toward a better understanding of evolution in the Catholic press in the Netherlands. A bibliography of 43 titles is appended.—*J. C. Th. Uphof.*

332. Wachter, W. H. **De werken van Abraham Munting. [The works of Abraham Munting.]** Nederland. Kruidk. Arch. 1924: 228–238. *5 fig.* 1925.—A description is given of the following works of Abraham Munting (1626–1683): (1) "Waare Oeffening der Planten," (2) "Aloidarium," (3) "Herba Britannica," (4) "Aardgewassen," and (5) "Phytographia Curiosa."—*J. C. Th. Uphof.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 7, 308, 311, 454, 574, 678, 775, 779, 1008)

333. Anonymous. **Colleges of agriculture in China.** Lingnaam Agric. Rev. 1^2: 99–103. 1923.—A brief presentation is made of the status and work of the College of Agriculture, National Southeastern University, Nanking; the College of Agriculture and Forestry, University of Nanking, Nanking; and the Lingnaam Agricultural College, Canton Christian College, Canton; which are the 3 oustanding institutions specializing in higher agricultural education in China.—*Albert N. Steward.*

334. Anonymous. **Current topics and events.** Nature 115: 920. 1925.—Reference is made to the publication of a series of 24 colored post cards showing plants in the Royal Botanic Gardens at Kew.—*O. A. Stevens.*

335. Anonymous. **New Zealand trees and plants.** New Zealand Life (New Ser.) 4^2: 13. 1925.—The first of a series of popular articles on New Zealand plants gives a description of the cabbage tree (*Cordyline australis*).—*H. H. Allan.*

336. Anonymous. **The University of Bristol.** Nature 115: 913–914. *1 fig.* 1925.—The opening of a new wing provides for expansion in botany.—*O. A. Stevens.*

337. Anonymous. **25 jähriges Jubiläum der Hoheren Forstlehranstalt Bruck a.d. Mur. [The 25th anniversary of the forest school at Bruck on the Mur.]** Wiener Allg. Forst- u. Jagdzeitg. 43: 169. 1925.

338. Anonymous. **Work and influence of the Royal Botanical Gardens, Kew.** Nature 115: 897–899. 1925.—This is a leading editorial, relating to the history and direction of the gardens.—*O. A. Stevens.*

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339. Anonymous. [Rev. of: Dawson, W. H. (Editor.) **The year-book of the universities of the Empire, 1925.** *xii + 808 p.* G. Bell & Sons: London, 1925.] Nature **115**: 833. 1925.—This includes announcements of grants for research and a list of subjects for specialized study. "We have found it remarkably accurate."—*O. A. Stevens.*

340. Anonymous. [Rev. of: Horwood, A. R. **Leaves from a naturalist's diary: with notes on what to look for month by month.** *192 p. 4 pl.* G. G. Harrap & Co.: London, Calcutta, Sydney, 1924.] Nature **115**: 977. 1925.

341. Allen, E. W. **The publication of research.** *19 p.* (Mimeographed.) U. S. Dept. Agric.: Washington, D. C., 1925.—In this lecture the following points are discussed: Importance of meritorious publication, the purpose of writing, obligation to the reader, preparation of manuscript, and editorial review.—*Frederick V. Rand.*

342. Bade, E. **When the leaves begin to fall.** Sci. Amer. **131**: 329. *5 fig.* 1924.—This treats popularly of the mechanism of leaf-fall.—*Chas. H. Otis.*

343. Borza, Al. **Dare de seamă despre starea Grădinii botanice din Cluj în anii 1919–1922. [Report on the state of the Botanic Garden of Cluj during the Years 1919–1922.]** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **3**: 88–97. *3 pl., 6 fig.* 1923.—A new botanic garden about 25 acres in extent was instituted at Cluj in 1920, with an extensive geographical section, representing the complete Rumanian and some foreign floras.—*Author.*

344. Borza, Al. **Dare de seamă despre starea Muzeului Botanic şi a Grădinei Botanice dela Universitatea din Cluj în anii 1923 şi 1924. [Report on the state of the Botanic Garden and Museum of the University of Cluj for the years 1923 and 1924.]** Bull. Inform. Grădinii Bot. Muz. Bot. Univ. Clûj **4**: 106–117. *1 fig.* 1924.—(See also preceding entry.)

345. Brown, C. E. **The trees of the campus.** *13 p.* Prepared for the use of students, Univ. Wisconsin, summer session. Madison, Wisconsin, 1925.

346. Fowkes, Henry L., and Edgar S. Jones. **School essentials in practical agriculture.** *394 p. Illus.* (*in part. col.*) Educational Publishing Co.: Boston, New York, (etc.), 1925.

347. Gager, C. Stuart. **The relation between science and theology: how to think about it.** *87 p.* The Open Court Publishing Co.: Chicago, 1925.—In this book the author, after emphasizing the fact that scientists, not theologians, should be looked upon as authorities on science, briefly outlines certain "fundamental facts," namely, cause and effect, secondary causes, a great first cause, evolution and biogenesis. The essentials of the scientific method are explained, namely, an open mind, toleration, recognition of the uniformity of nature, and the processes of thought. The concluding chapters are: Fact and hypothesis in evolution; science and the Bible, evolution and religion, and a short summary.—*A. H. Graves.*

348. Graves, Arthur Harmount. **A preliminary list of native and naturalized woody plants of Greater New York.** Brooklyn Bot. Gard. Leaflets **13**$^{7-9}$: 1–12. 1925.—This list, designed for use in the classes at the Brooklyn Botanic Garden, comprises the trees, shrubs, and woody climbers growing wild in Greater New York, with their botanical and common names, arranged by families in systematic sequence.—*Author.*

349. Haldane, J. S. **Natural science and religious beliefs.** [Rev. of: (1) Russell, Bertrand. **What I believe.** *95 p.* Kegan, Paul & Co.: London; E. P. Dutton & Co.: New York, 1925.—(2) Keith, Arthur. **The religion of a Darwinist: Conway memorial lecture delivered at South Place Institute on March 26, 1925.** *76 p.* Watts & Co.: London, 1925.—(3) Thomson, J. Arthur. **Science and religion.** *ix + 238 p.* Methuen & Co.: London, 1925.] Nature **115**: 667–669. 1925.

350. Hardwick, J. C. **Science and religion.** [Rev. of: (1) D'Arcy, Charles F. **Science and creation: the Christian interpretation.** *vi + 126 p.* Longmans, Green & Co.: London, 1925.—(2) Mathews, Shailer, and others. **Contributions of science to religion.** *vi + 427 p. 75 pl.* D. Appleton & Co.: New York, London, 1924.—(3) Morris, Morris. **New light on genesis: or creation during descent in the scriptures.** Marshall Bros.: London, Edinburgh, New York, 1924.] Nature **115**: 795–796. 1925.—The first 2 are regarded as very noteworthy books.—*O. A. Stevens.*

351. Howard, R. **Microscopic vegetable growing.** Sci. Amer. **131**: 322–323. *6 fig.* 1924.—This is a popular exposition on the nature, commercial manufacture, and uses of yeast.—*Chas. H. Otis.*

352. Keinholz, Raymond. [Rev. of: Brown, William H. **A text-book of general botany.** *xi + 484 p. Illus.*; and **Laboratory botany.** *xiv + 168 p. Illus.* Ginn & Co.: New York (etc.), 1925.] Science 61: 567–568. 1925.

353. McMillan, George. **The agricultural high school in Ontario.** *129 p.* Univ. Toronto Press: Toronto, 1924.

354. Robson, Forster. **Our wayside trees and how to know them.** (How to know them series.) *New ed. 125 p.* Thornton Butterworth, Ltd.: London, 1923.

355. Saint-Yves, A. **Inauguration des nouvelles installations du Conservatoire botanique de Genevé.** [Inauguration of the new installations of the Botanical Conservatory of Geneva.] Bull. Soc. Bot. France 71: 1062–1064. 1924.—This describes the exercises celebrating additions to the buildings of the Botanical Conservatory of Geneva, made necessary by the increasing size of the collections and the library. The general herbarium comprises about 1,000,000 specimens. To this should be added the herbarium of 240,000 specimens of Europe and of the Maritime-Alps of Emile Burnat (1904); and the collections of the de Candolle family (1921) of 400,000 specimens. At the same time the library has been increased, notably from the Candollean library. The catalog contains more than 50,000 cards. A collection of about 3,000 portraits is also deposited here. The scientific correspondence of the de Candolles should be added (4,500 pieces). The inauguration of the enlarged quarters designed to hold these rich collections occurred October 13, 1924. It coincides with the publication of the first volume of a new periodical—*Candollea*—designed to replace the old *Annuaire du Conservatoire botanique de Genève.*—*J. Beauverie.* (*Adapted by A. H. Graves from French abstract.*)

356. Strasburger, E. **Handbook of practical botany for the botanical laboratory and private student.** Transl. and edited from the German with many additional notes by W. Hillhouse. *8th rev. ed.* by W. Leach. *xxv + 534 p. 164 fig.* G. Allen & Unwin: London; Macmillan & Co.: New York, 1924.

357. Waters, Henry J. **Agricultural laboratory exercises and home projects adapted to secondary schools.** *Rev. ed. vi + 211 p. Illus.* Ginn & Co.: Boston, New York, (etc.), 1925.

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 50, 175, 307, 460, 542, 559, 586, 748, 755, 770, 796, 804, 820, 826, 827, 1080, 1178, 1183)

358. Bache Wiig, Sara. **Sur le vacuome d'Erisiphe graminis D. C.** Compt. Rend. Acad. Sci. Paris 180: 309–311. 1925.—A study is made with intravital stains, especially cresyl blue. Support is given to Dangeard's contention that the vacuoles are permanent cell organs, like the nucleus and plastids, and do not arise *de novo* in the cytoplasm. Hyphae and conidiophores were studied. A vacuome of large vacuoles is characteristic of inactive cells, one of small vacuoles of quite active cells, and a vacuome of filamentous or reticular form is characteristic of the most active cells.—*C. H. Farr.*

359. Beauverie, J. **Le symplasme bactérien existe-t-il? Cas de l'Azotobacter.** Compt. Rend. Acad. Sci. Paris 180: 1792–1794. 1925.—An analysis is made of the evidence for symplasms and it is concluded that such have not yet been satisfactorily demonstrated, but that its indication may be explained as an artifact, as a result of degeneration, or as an erroneous interpretation.—*C. H. Farr.*

360. Cooper, M. L. **Capsulated bacteria. With special reference to B. typhosus.** Jour. Infect. Diseases 36: 439–443. *Fig. 1–2.* 1925.—Two methylene blue capsule stains are outlined. By use of one, capsules are demonstrated on 9 organisms not generally considered as possessing capsules: *B. typhosus, B. coli, B. enteritidis, B. dysenteriae*-Shiga, *B. paratyphosus* A., *B. paratyphosus* B., *B. fecalis-alkaligenes, B. proteus-vulgaris,* and *B. cloacae.*—*R. L. Starkey.*

361. Dangeard, Pierre. **Recherches de Biologie cellulaire (Evolution du systeme vacuolaire chez les vegetaux).** [The biology of the cell: The development of the vacuolar system in

plants]. Le Botaniste 15: 1–267. *Pl. 1–14.* 1923.—By means of vital staining and comparison with fixed material, the author has shown vacuoles to be permanent cell organs. Their form may differ according to internal cell conditions. They may appear as ordinary vacuoles, as aleurone grains, or as more or less fine reticulate structures, but they are always present.—Other cell organs are also considered in more or less detail, especially the plastids. The development of tannin was followed and found to occur only in the vacuoles. Tannin was succeeded in certain cases by anthocyan.—The changes in form, content and reaction of vacuoles were traced in the meristematic region of buds and root tips, in various organs of seed and seedlings, and in pollen in various stages of development.—Material was used from *Taxus baccata, Larix leptolepis* and *L. europea, Abies Nordmanniana, Picea excelsa, Cedrus Libani, Gingko biloba, Torreya nucifera, Pinus pinaster, Thuja orientalis, Cupressus sempervirens* and *C. lawsonia, Biota orientalis, Cephalotaxus fortunei*, and species of wheat, barley, oats, corn and *Ricinus.—E. L. Proebsting.*

362. Delaunay, L. **The S-chromosomes in Ornithogalum L.** Science 62: 15–16. *1 fig.* 1925.—Chromosomes that possess satellites are found in several species and are called S-chromosomes. Persidsky found them in *Ornithogalum umbellatum* L. in 1915 and since 1921 the author has found them in *O. Narbonense* L., *O. tempskyanum* Fr. et Sint. and *O. oligophyllum* Clarke. Reproductions of them are shown in a figure.—*C. J. Lyon.*

363. Fauré-Fremiet, E. **État quiescent et état actif chez les amibocytes d'Arénicole. [The quiescent and active states of the amibocytes of Arenicole.]** Compt. Rend. Acad. Sci. Paris 180: 396–399. 1925.

364. Guilliermond, A. **Nouvelles observations sur la structure des Cyanophycées. [New observations on the structure of the Cyanophyceae.]** Compt. Rend. Acad. Sci. Paris 180: 951–954. 1925.—It is shown that the cells of the blue-green algae contain many very small vacuoles filled with metachromatin, which is thus localised in the cytoplasm and not in the nucleus.—*C. H. Farr.*

365. Guilliermond, A. **Sur l'instabilité de formes et la permanence des mitochondries. [The instability of form and the permanence of mitochondria.]** Compt. Rend. Acad. Sci. Paris 180: 221–223. *Fig. A–D.* 1925.—The observations of mitochondria in living animal tissues reveals that they vary greatly in form and even may appear and disappear during a short lapse of time. The observations so far made on living plants give different results. Living cells of *Saprolegnia* and *Elodea* in drop culture were observed continuously for as much as an hour. In some cases there are no changes in form; they are then usually rectilinear in shape. In their movement they take on various forms resembling the movements of spirochaetes. Figure A shows 48 forms assumed by the same chondricont successively within ½ hour. The progressive segmentation of chondriconts of *Elodea* is also figured. It is concluded that in the granular form the mitochondria of plants are immobile; in the chondriocont stage they change progressively. These transformations are due in large part to cytoplasmic streaming.—*C. H. Farr.*

366. Hosselet, C. **Les oenocytes de Culex annulatus et l'étude de leur chondriome au cours de la sécrétion. [The oenocytes of Culex annulatus and the study of their chondriome in the course of secretion.]** Compt. Rend. Acad. Sci. Paris 180: 399–401. 1925.

367. Huskins, C. L. **Chromosomes in Avena.** Nature 115: 677–678. 1925.—The writer studied the false wild oat (a form of *Avena sativa*) and secured results quite similar to those of Winge in aberrant forms of wheat.—*O. A. Stevens.*

368. [Karpechenko, G. D.] Карпеченко, Г. Д. **Кариодогинеский очерк рода. Trifolium L. [Cytological studies of the genus Trifolium L.]** Труды по Прикладной Ботанике и Селекции. [Bull. Appl. Bot. and Plantbreed.] 14: 271–279. 1925.—Twenty-four species from various sections of the genus *Trifolium* were investigated cytologically. Species with 14, 16, 32, 48, and even approximately 80 and 130 chromosomes were found. The size of the chromosomes is in no way contingent upon their number. The peculiar and sterile mutant described by Rudzinsky in 1914 does not differ in chromosome content from its parent, *T. pratense.—E. Barulina (translated).*

369. [Kholodnyi, N. G.] Холодный, Н. Г. **О метаморфозе пластид в волосках подводных листьев. [Metamorphosis of the plastids in the hairs of submerged leaves.]** Журнал

Русского Ботанического Общества. [Jour. Russian Bot. Soc.] 7: 153–160. 1922.—The author describes the regressive metamorphosis of the plastids in the hairs of the old submerged leaves of *Salvinia natans*, where they are represented by minute colorless bodies (leucoplasts), while in the young cells they are typical chloroplasts. The author establishes connection between this process of degeneration and the transformation of these organs of assimilation into organs for absorbing water with the substances dissolved in it. The metamorphosis proceeds more rapidly in the apical cells; the basal cells preserve their similarity to the chloroplasts of the air leaves much longer. The author holds that the degenerated plastids of *Salvinia natans*, in spite of their external similarity to the chondriosomes, have nothing in common with these structures.—*Dorochenko.*

370. Kuhner, R. **Sur la nature des cystides chez les Basidiomycètes. [Nature of the cystids of Basidiomycetes.]** Compt. Rend. Acad. Sci. Paris 180: 454–457. *Fig. 1–5.* 1925.—The cystids have been considered by some as simple sterile structures analogous to the paraphyses of the Ascomycetes; others consider them intermediate between paraphyses and basidia. Maire found that, in some cases, the 2 nuclei in the cystids fuse. The species here studied in *Mycena fellea.* The cystids become binucleate by the formation of a wall at the end of a multinucleate hypha. The nuclei fuse, but the fusion is incomplete, at least so far as the nucleoles are concerned. This fusion nucleus undergoes a mitosis which resembles the reduction division. It is therefore concluded that the cystids are not sterile ends of hyphae, but that they are true basidia which have been arrested in development.—*C. H. Farr.*

371. Lenoir, Maurice. **La télophase de la division I dans le sac embryonnaire du Fritillaria imperialis L. [The telophase of the first division in the embryo sac of Fritillaria imperialis L.]** Compt. Rend. Acad. Sci. Paris 180: 160–163. 1925.—This is a very short stage, but involves many changes. The chromosomes are slender moniliform bands with an axis of nucleoline. They expel granules into the cytoplasm. The chromosomes impregnated with reticulin first are reduced to chains and then form complete threads. The chromosome skeleton then exudes droplets of nucleolin into the cytoplasm. Nucleoles are thus formed.—*C. H. Farr.*

372. Linsbauer, K. **Über Teilungsanomalien und metaplastische Chlorophyllbildung in der Epidermis von Monstera. [Anomalies in cell division and metaplastic development of chlorophyll in the epidermis of Monstera.]** Zeitschr. Pflanzenkrankh. 34: 220–223. *5 fig.* 1924.

373. Litardiere, R. de. **Le phénoméne de cytomixis dans les microsporocytes du Podophyllum peltatum L.** Compt. Rend. Acad. Sci. Paris 180: 1771–1773. 1925.—The passage of the chromatin or nucleus from one cell to another is discussed as to the various theories explaining the phenomenon. The author inclines to the view that the evidence from this study shows that it is not a normal process, since many of the nuclei are intact. It is also not due to fixatives alone, though certain defective fixation may accentuate the effect. It is regarded as an indication of the degeneration of the nuclei.—*C. H. Farr.*

374. Maige, A. **Évolution et verdissement des plastes dans les cellules cytolédonaires de diverses légumineuses pendant la germination. [The development and greening of plastids of cotyledonary cells in various legumes during germination.]** Compt. Rend. Acad. Sci. Paris 180: 855–857. 1925.—Isolated and attached cotyledons of peas and beans are studied. The greening of the cotyledons is found to be due to the formation of inactive plastidal units in the chloroplasts. Their development involves either directly or indirectly an amyliferous stage according to whether the sugar of the cell is lower or higher than the threshold of condensation.—*C. H. Farr.*

375. Mangenot, G. **Sur le mode de formation des grains d'amidon dans les laticifères des Euphorbiacées. [The mode of formation of starch grains in the laticiferous tubules of the Euphorbiaceae.]** Compt. Rend. Acad. Sci. Paris 180: 157–160. *Fig. 1–11.* 1925.—Potter in 1884 reported the laticiferous tubules as arising in the protoplasmic corpuscles, and Molisch in 1901 said they were formed in the leucoplasts. It is now found that they appear in the interior of elongated chondriocontes. Many species are studied.—*C. H. Farr.*

376. Meyer, K. F. **The "bacterial symbiosis" in the concretion deposits of certain**

operculate land mollusks of the families Cyclostomatidae and Annulariidae. Jour. Infect. Diseases 36: 1–107. *Pl. 1–16.* 1925.—An extensive study on concretions developing in land mollusks. The concretions are situated in large cells (purinocytes) in connective tissue of intestinal loops, the stomach and pouches of the digestive gland. The purinocytes are generally studded with intracellular bacteria-like bodies 0.4–0.5 × 2–5μ in size. The concretions are largely uric acid and purine bases. Phagocytosis of both the bacterial bodies and the concretions by amoebocytes was noted. Bacteria were cultured from the purinocytes. The 526 cultures obtained were classified into 4 large groups: (1) Fluorescens group, (2) alkaligines group, (3) herbicola group, and (4) colon group. They appeared to be representatives of soil and water organisms and were found commonly in the intestinal tracts of the mollusks. The associated action of these organisms effected the decomposition of purine bases and broke down uric acid to urea and ammonia which are considered to be suggestive of the transformations which they might produce within the host. The purinocytes appear to act as excretory organs and the concretion deposits contained therein may serve as temporary storage of metabolic products which may be utilized during periods of starvation or inactivity, the bacteria or symbiotes aiding in this transformation. "Until further investigations have broadened the field and the physiological significance of intracellular symbiotic habitat has been established by carefully controlled experiments, it appears advisable to formulate a working hypothesis and to accept the cultures as those of the symbiotes, irrespective of the negative or inconclusive serological findings," although it is further stated that "the results warrant the conclusions that the intracellular symbiotes have not been cultivated." Further, "the final decision concerning the true relationship of the cultivated bacteria to the intracellular symbiotes of *Cyclostoma elegans* must be left open."—*R. L. Starkey.*

377. Möllendorf, Wilh[elm] von. **Unterzuchungen zur Theorie der Färbung fixierter Präparate. 1. Krebs, Hans Adolph. Über die Färbbarkeit des Skelettmuskls. [Researches upon the stainability of fixed preparations. 1. Krebs, Hans Adolph. The stainability of the skeleton muscles.]** Arch. Mikrosk. Anat. 97: 554–580. *Fig. 1–11.* 1923.—The investigation, carried out on the back muscles and those of the hind extremities of a 27 day-old white mouse, is a comparative study of a large number of stains. The material was fixed in sublimate-formol, imbedded in celloidin-paraffin, and sections were cut 5 microns thick. Sections were immersed for 24 hours in the particular stains, after which they were removed, blotted, allowed to dry fully, and then mounted in balsam. Dehydration in alcohol would react variously with the different stains used. Only aqueous solutions of the dyes were used. The author concludes that on cross-striped skeleton muscles, all dyestuffs which possessed similar dispersion grades possessed similar staining properties. Other relationships between stainability and dyestuff properties could not be revealed. The colloid state of a dyestuff is highly independent of its solution properties. Dyes with similar dispersion indices stain in a similar manner, while dyes with different solution properties always act differently. Relationships between the chemical constitution of the dyes and their division in the fixed preparation could not be determined. An answer must be sought in facts pertaining to the physical properties of the dyes and in their dispersion factors. This property is the diffusion-rate of the dye, which is independent of the thickness of the tissue as well as of the dispersion factor of the dye. The 1st factor arranges the sequence of the various dyes for the particular structures; the 2nd, their rapidity of penetration. With these assumptions, all staining phenomena on muscular tissue may be explained. It permits relationships between stainability and morphological properties to be settled. The dyes are reagents for establishing thickness relationships rather than for determining chemical properties.—*H. C. Sands.*

378. Piech, K. **Ueber die Teilung des primären Pollenkerns und die Enstehung der Spermazellen bei Scripuspaluster L. [The division of the microspore nucleus and the development of the male cells in Scirpus paluster L.]** Bull. Acad. Polonaise Sci. et Let., Cl. Sci. Math. et Nat. Ser. B Sci. Nat. 1924: 605–621. *Pl. 45–46.* 1924.—The author finds a deviation from the common type of development in the formation of the generative cell. After the two nuclear divisions in the pollen mother cell, a tetrad without cell plates is formed. The 4 nuclei lie free within the cell. Three of them soon degenerate, while the 4th becomes the single functional nucleus. It lies in the middle of the mother-cell and divides into 2 nuclei

differing in size, the smaller of which is the generative nucleus. The latter soon becomes surrounded with cytoplasm which differentiates into 2 concentric layers with a vacuole between them. Thus the generative cell is formed. Two spindle or spherical-shaped male cells originate from the division of this generative cell.—*S. Satina.*

379. Tsinen, Sou Jou. **Recherches sur l'histologie des plantes panachées et sur le mécanismes cytologique de la panachure.** [Researches on the histology of variegated plants and on the cytologic mechanism of variegation.] Thesis, Univ. of Nancy. *104 p. Pl. 1–13, fig. 1–10.* Les Presses Univ. de France: Paris, 1924.—The author studied those forms of variegation which have to do with change in color or morphology of the plastids or of the mitochondria from which they originate. After a historical account of previous investigations on the cytology, histology, chemistry, physiology, genetics and causes of variegation he proceeds to a discussion of his own researches on the following plants: *Zebrina pendula albo-vittata* Schnizl., *Z. pendula aureo-variegata* Schinzl., *Abutilon Sawitzii* Paxt., *A. Thomsoni* Veilch., *Humulus japonica* S. & Z., *Vinca major* L., and *Aucuba japonica* Thunb. According to the author, there are 2 histological types of variegation: the "déformante" and the "non déformante." According as all or only a part of the cells or cellular layers of a region are affected the results present in any particular leaf all gradations between the intense green of the normal and the various shades of yellow or white of the variegated leaf. From the cytological point of view, variegations occur as the result of an alteration of the plastid apparatus which may take place at the opportune moment when the elements from which the plastids originate are still in the chondriosome stage, in different stages of their development into plastids, or, finally, in their adult forms when these elements have attained the state of fully developed plastids. The histological and cytological changes in variegation are illustrated and a literature list of 6 pages is included.—(See also Bot. Absts. 14, Entry 8434.)—*Frederick V. Rand.*

ECOLOGY

Geo. D. Fuller, *Editor*

(See also in this issue Entries 77, 107, 120, 154, 160, 161, 174, 242, 257, 490, 491, 547, 645, 654, 690, 712, 718, 753, 760, 765, 776, 781, 789, 790, 852, 917, 1014, 1028, 1030, 1031, 1107, 1108, 1139, 1152, 1173, 1240, 1285, 1295, 1311)

GENERAL FACTORS, MEASUREMENTS

380. Anonymous. **Wesen und Bedeutung der Waldtypenlehre.** [Meaning of the forest type area.] Wiener. Allg. Forst- u. Jagdzeitg. **43**: 86. 1925.—This is a brief explanation of the work of Cajander with types of forest and other vegetation.—*F. S. Baker.*

381. Anonymous. **Water plants** [Rev. of: Glück, Hugo. **Biologische und morphologische Untersuchengen über Wasser und Sumpfgewüchse. Vierter Teil: Untergetaucht und Schwimm-blattflora. (Biological and morphological studies of water and swamp plants. 4. Submerged and floating floras.)** *viii + 746 p. 8 pl.* Gustav Fischer: Jena, 1924 (see Bot. Absts. 13, Entry 7574).] Nature **115**: 635–636. 1925.—The book contains much new material and the treatment of *Nuphar* and *Nymphaea* is especially good. The role of light intensity has been somewhat neglected.—*O. A. Stevens.*

382. [Alekhin, V.] Алехин, В. **Основные черты в распределении растительности Европейской России.** [The distribution of the vegetation in European Russia.] *48 p. 3 fig., 3 maps.* Moscow, 1921.—This paper gives a concise scheme for the distribution of the vegetation on the plains of European Russia, emphasizing the phenomena of zones.—*E. Sinskaja.*

383. [Alekhin, V. V.] Алехин, В. В. **Растительность лугов р. Вороны.** [The vegetation of the meadows of the Vorona River.] Журн. Московск. Отд. Русск. Бот. Общ. (Jour. Sect. Moscou Soc. Bot. Russie) **1**: 28–57. 1922.—The author concludes that all the diversity of the vegetation of the meadows may be reduced to about 20 associations (in all 30 associations including the least important). Two series of ecologically different associations may

be distinguished. One has soil with more or less humic acid and is poorly aerated. Its associations are those characterized by *Festuca rubra, Deschampsia caespitosa, Agrostis alba, Heleocharis palustris,* and *Carex Goodnoughii.* The other has soil of a character contrasting with the first and its principal associations are characterized by *Alopecurus pratensis; Alopecurus pratensis* and *Poa palustris; Poa palustris;* and *Beckmannia eruciformis.*—*E. Sinskaja (translated).*

384. Antevs, Ernst. **The big tree as a climatic measure.** Carnegie Inst. Washington Publ. 352. *1 pl., 7 fig.* 1925.—This paper deals with a revision of Ellsworth Huntington's study of the big trees of California, *Sequoia washingtoniana,* as a climatic measure. Trees growing on dry ridges, high above water, were selected and for comparison those in the moist bottoms of the valleys in or close to water. These 2 groups were treated separately. The measurements of each age-group were added and curves plotted, the curves being corrected by a new graphic method for growth-variations. The parts of the curves between 1301 and 2100 years of age were added separately, also the parts younger than 1301 years separately. Parts older than 2100 years were not used. The sums obtained were divided by the totals of the measurements and the results were plotted in curves which record as accurately as the material permits the climatic fluctuations which have influenced growth. Curves for the whole "dry" and "moist" material were secured. Finally a curve was obtained in a somewhat different way.—The variations of the final curves, corrected for variations depending on flaring and on different rates of growth according to age, may be due largely to changes in climate and weather, for influences caused by shading, liberation, abundant seed production, defoliation or other injury caused by insects, fire, frost, wind, etc., are essentially eliminated by the large number of measurements from different regions and by omission of trees showing such effects. A comparison of these curves and Huntington's curve, obtained in a different way, reveals the remarkable fact that they all agree in those parts that are computed from a very large amount of material. The correspondence is even detailed, since 800 A.D. The agreement evidently is real and almost certainly of climatic origin. The chief climatic factors influencing the growth appear to be precipitation, temperature, and soliar radiation. The relative role of each factor is dependent upon other factors, and upon internal conditions in the tree.—The importance of the individual factors is the more difficult to estimate since temperature data may at one time be controlled by one factor at another time by another. It appears to be certain that the Sequoia curves do not necessarily at all times record precipitation; in this connection it is worth mentioning that the tree-growth maximum during the 14th century coincided with an exceptional spottedness of the sun and with the climatic stress of which there are abundant historical records in the Old World, and which expressed itself in unusually cold winters, cold rainy summers, and devastating storms. Before satisfactory interpretation of the Sequoia curves can be made and conclusions drawn from them regarding the climate of the past, it is necessary to have data on temperature, better knowledge of the relation between precipitation and growth of Sequoia trees in dry situations, and more knowledge of the relationship between soliar radiation and growth.—*From author's abstract.*

385. Arrhenius, O. **Der Kalkbedarf des Bodens vom pflanzen-physiologischen Standpunkt. II. Die Bodenreaktion und das Wachstum der höheren Pflanzen. [Calcium requirements of the soil from the plant physiology view point. II. Soil reaction and growth of higher plants.]** Zeitschr. Pflanzenernahr. u. Düngung **4**: 30–52. 1925.—One hundred and forty references are given.—*F. M. Schertz.*

386. [Baranov, P.] Баранов, П. **К познанию растительности горных каменистых осыпей. [The vegetation on rock debris in the mountains.]** Бюлл. Средне-Азиатского Государств. Университета. (Bull Central Asiatic State Univ. Tashkent.) 9. *1–17.* 1925.—An analysis of the flora on rock debris in the median and upper zones of the Western Tien-Shan has revealed the extraordinary diversity of the composition of the vegetation represented by different ecological types from typical mesophytes to typical xerophytes. The author holds that during the arid summer months the mesophytic vegetation draws on the considerable moisture stored in the thin layer of soil underlying the cover of stones. Accordingly, plants may become established only in places where this cover does not exceed

20–25 cm. The root system of the majority of the plants develops chiefly in the upper layer of the soil immediately under the layer of stones, its general direction being towards the base of the rock slide, that is, up hill.—*Dorochenko.*

387. Borza, Al. **Contribuţii la cunoaşterea vegetaţiei şi florei Insulei Şerpilor. [The vegetation and flora of the Island of Serpents.]** Bul. Soc. Ştiinte Cluj 2^2: 49–68. *6 fig.* 1924. —This little island of 17 hectares is covered by a grassland in which associations characterized by the following species are distinguished: (1) *Bromus hordaceus*, and *B. longipilus;* (2) *Calamagrostis epigeios, Matricaria chamomilla, Atriplex tartaricum* and *Holosteum umbellatum;* (3) *Matricaria chamomilla* and *Leptobryum pyriforme;* (4) *Psorotrichia riparia* and *Rhizocarpon calcareum* (lichens); and (5) an algae association with *Cystosira, Ceramium, Corallina, Cladophora* and *Polysiphonia.* The 17 species of seed plants are mostly Pontic and Mediterranean. The following forms are new: *Vulpia myuros* f. *breviglumis, Trifolium intermedium* f. *hirsutior* and *Matricaria chamomilla* f. *debilis.*—The island seems a special floristic region.—*Author (translated).*

388. Bos, H. **Phaenologische waarnemingen. [Phenological observations.]** Landbouwk. Tijdschr. 37: 193–200. 1925.—Phenological data as to flowering, fruiting, etc., of a large number of plants are given for 30 different localities in the Netherlands.—*J. C. Th. Uphof.*

389. Braun-Blanquet, Josias, et Jules Pavillard. **Vocabulaire de sociologie végétale. [Vocabulary of plant sociology.]** *2nd ed. 22 p.* Montpellier, 1925.—This is a reprint with revisions and additions of a pamphlet issued in 1922 (see Bot. Absts. 12, Entry 5454). It gives in French, with German equivalents, the terms in current use by the workers in the field of phytosociology, each term being defined and discussed.—*Geo. D. Fuller.*

390. Cajander, A. K. **Zur Begriffsbestimmung im Gebiet der Pflanzentopographie. [The concept of plant topography.]** Acta Forest. Fennica 20. *1–8.* 1922.—The publication is intended to elucidate and establish more firmly in plant topography concepts pertaining to vegetation and locality.—*L. Ilvessalo.*

391. Campbell, E. G. **Plant relations in Brazos county, Texas, with special reference to eastern and western types.** Ecology 6: 163–170. 1925.—This region has an annual temperature ranging from 2° to 110°F., with a mean of 68°. The annual precipitation ranges from 22 to 61 inches, with a mean of 38 inches. In general the flora belongs to the Gulf Coastal Plain but eastern and western types also are telescoped. Western species are more successful and more responsive to local conditions than eastern species. The eastern trees drop out rapidly in this region. In the eastern part of the county there are 12 species of oaks, in the western part there are only 5 species. *Prosopsis glandulosa,* a western species forming a small tree with a trunk up to 6–10 inches in diameter, has progressed rapidly across the county since 1900. Western xerophytic species are migratory eastward through fields, open pastures, and dry ridges, while eastern species are making their way westward along streamways and ravines.—*Herbert C. Hanson.*

392. Chouard, P. **Monographies sociologiques. I. La région de Brigueil l'Aîné (Confolentais). [Phytosociological monographs. I. The region of Brigneil l'Aine (Confolentais, France).]** Bull. Soc. Bot. France 71: 1130–1158. *6 fig.* 1924.—France is so largely untouched phytosociologically that the author has undertaken a series of monographs of which this one, dealing with a siliceous region, is the first. He has endeavored to limit the number of associations, preferring to subdivide a few associations into facies or varieties depending on the presence of "constants" or "characteristics." He emphasizes the characters that indicate the plasticity or rigidity of the species. The area investigated comprises 25 sq. km. of siliceous soil west of the Charente, forested and possessing many ponds. The climate is temperate and humid. The associations recognized and described are: (A) Pond associations including those of (1) *Myriophyllum alternifolium* with a zone including also *Nymphea alba;* (2) *Scirpus lacustris;* and (3) *Carex ampullacea.*—(B) Associations of sandy shores characterized by (4) *Littorella* and *Heleocharis,* with variations; (5) *Carex vesicaria;* and (6) *Agrostis canina* and *Carum verticillatum.*—(C) Associations of turf pits (tourbieres) with *Potamogeton polygonifolius* and *Rynchospora alba,* including variations caused by amount of flooding; (8) heaths (Sphaignes émergées) with several facies characterized by *Erica tetralix,*

Drosera rotundifolia and *Carex paniculata.*—(D) Associations of the streams (9) *Callitriche stagnalis* and *Myosotis palustris* in running water; and (10) *Cyperus flavescens* in depressions. (E) Hydro-mesophytic prairies, with associations of (11) *Arrenatherum elatus, Trisetum flavescens* and *Agrostis vulgaris;* and (12) *Alnus glutinosa,* with various facies.—*J. Beauverie* (*translated*).

393. Dunlop, W. R. **Rainfall correlations in Trinidad.** Nature **115:** 802. 1925.—Reference is made to a report by Preston E. James, that he found a positive correlation between the rainfall of one 6-month period and the size of coconuts.—*O. A. Stevens.*

394. DuRietz, G. Einar. **Zur methodologischen Grundlage der modernen Pflanzensoziologie. [Foundation of modern plant sociology.]** *272 p. 23 fig.* Author's publication; Upsala, 1921.—This is a comprehensive study of plant sociology. The 1st chapter contains a discussion of such concepts as species, types, associations, formations, and association-complexes. The 2nd chapter deals with the position of plant sociology in biology and also includes a critique of current terminology. An extensive history of the subject is given in chapter 3, from its foundation by Alexander von Humboldt to the present day. This is taken up by countries, for example, the Upsala school, school of Raunkiaer, North American plant sociology, Great Britain, New Zealand, and others, citing the outstanding contributions of each school. Scandinavian vegetation is discussed from the point of view of types, arrangement in strata, and formations. Many data are given concerning the minimal area of associations. The constancy of constant species in larger areas is discussed. Other chapters deal with laws of quantitative relations between species in associations, regularity in number of species in an area, constitution of formations and association-complexes, and practical methods of plant sociology. An extensive bibliography is appended.—*Constance E. Hartt.*

395. Enculescu, P. **Contribuţiuni la Vegetaţia fanerogamică a Insulei Şerpilor. [Vegetation of the Island of Serpents.]** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **4:** 89-95. *2 fig.* 1924 [1925].—This island in the Black Sea is covered with a black soil enriched by depositions of humus and the droppings of birds. The distribution of vegetation seems to be determined by the character of the soil. In the spring and early summer the vegetation is luxuriant but later it dries up completely. The green plant carpet is renewed during the moist autumn.—A list of 38 seed plants is given.—*Al. Beza* (*translated*).

396. Evermann, Barton W., and Howard W. Clark. **Lake Maxinkuckee—A physical and biological survey.** Indiana State Dept. Conserv. Publ. 7. 2 vols. *660 + 512 p. map.* 1920.—Volume I is devoted mainly to fish. The greater portion of volume II lists the flora of the lake and vicinity. Much important data is incorporated in the report based on observations regarding the abundance, distribution and habits of the various species. Many hundred specimens representing most of the species were collected and are deposited in the United States National Herbarium.—*T. G. Yuncker.*

397. Farrow, E. Pickworth. **On the ecology of the vegetation of Breckland. VIII. Views relating to the probably former heath distribution of Calluna in England.** Jour. Ecol. **13:** 121–137. *1 fig.* 1925.—Evidence is presented that tends to show that Calluna heath is frequently a developmental phase in the degeneration of woodland due to the attack of grazing animals, including rabbits, and that more severe biotic attack leads to the degeneration of the heath to grassland. It seems probable that the present distribution of *Calluna* in Britain is merely a remnant of its former abundance. It is also stated that it seems probable that much of the present treeless area of Breckland was formerly forested, the trees having disappeared in consequence of cutting and the attacks by animals. Enclosures protected from rabbits often show the development of tree seedlings. Where woodland is invaded by and gives way to heath plants, it seems that it is always due to a biotic attack on the tree seedlings. Emphasis is placed on the general conclusion that biotic factors, such as the attack of rabbits, are of great importance and have influenced the vegetation of England more than is commonly realized.—*Geo. D. Fuller.*

398. Farrow, E. Pickworth. **Plant life on East Anglian heaths. Being observational and experimental studies of the vegetation of Breckland [England].** *x + 108 p. 23 pl., 10 fig.* Cambridge Univ. Press: London, 1925.—This is a description of the vegetation of sandy plains

in the northwest corner of Suffolk and the southwest corner of Norfolk. With a rainfall of 22.5 inches, much of the upper parts are now occupied by *Calluna vulgaris*, *Pteris aquilina* and dwarf grass heath. The description of this vegetation and the consideration of the factors responsible for its development constitute the subject matter of the book which is essentially a reprint, with minor changes and revision, of a series of articles that have appeared in the Journal of Ecology and have been abstracted. (See Bot. Abst. 1, Entry 824; 4, Entry 282; and this issue, preceding entry.)—*Geo. D. Fuller.*

399. Fischer, Robert. **Ueber die Oekologie der Algen Mährens und Westschlesiens. [Ecology of the algae of Maronia and western Silesia.]** Verhandl. Zool.-Bot. Ges. Wien **73:** (54–58). 1923.—This preliminary report outlines the author's methods. The region is divided into 3 districts which differ in geological and climatic conditions, each possessing a different algal flora. The algae are classified as aerophytes, hydrophytes and kryophytes. In aerophytes (especially the genus *Trentepohlia*) the distribution of each species is in accordance with precipitation. In the hydrophytes temperature and oxygen content are most important but the general chemical content of the water is also a controlling factor. Five different temperature groups are distinguished: (1) Microthermophils, up to 8°C; (2) Mesothermophils, with a maximum of 12°C.; (3) Macrothermophils, to 20°C. or higher; (4) Euthermophils, in hot springs and; (5) Sphagnophils, resistant to temperature alternations of 30°C. or more. The waters of the region are classified as, (1) salt, (2) high in calcium, (3) low in calcium and (4) low in both calcium and nitrogen. By means of a bilinear system it is possible to combine temperature, chemical content and certain ecological units and to obtain a factor which fairly well designates a specified algae formation.—*Author (translated).*

400. Fries, Thore C. E. **Uber primäre und sekundäre Standortsbedingungen. [Primary and secondary habitat factors.]** Svensk Bot. Tidskr. **19:** 49–69. *3 fig.* 1925.—There may be ecological (physiological) as well as historical reasons for the existence of a species or a plant association. Biological factors may act in a way similar to historical ones and result in different associations in places with equal physico-chemical and climatic conditions. The plant communities that develop in a certain region gradually change the character of the region. Primary and secondary habitat factors must, therefore, be distinguished, the former belonging to the original soil, the latter resulting from the actions of the invading plants. The habitat factors are divided as follows: (1) Physico-chemical, both primary and secondary, (2) biotic and (3) historical ones. The importance of secondary factors has been neglected, for example, the products of decomposition of the dominant lichen species change the character of the substratum and cause the change of accessory species. The author further discusses the meaning of the term "ecological factor," and regards it useless to discuss the ecological conditions of plant communities until the meaning of the terms is strictly determined. The author and R. E. Fries investigated the composition of the mangrove vegetation of Africa (Mombasa) and found only 4 species, all constants, and limited to this association which is apparently a very old one. They are *Rhizophora mucronata, Bruguiera gymnorrhiza, Ceriops Candolleana* and *Avicennia officinalis.* The author arrives at the conclusion that old plant communities are composed of more specialized species and contain more constants than younger ones. European plant communities are mostly young, and the different plant associations accordingly have many species in common. The thesis that old plant communities consist of specialized species is further illustrated by descriptions of plant communities on the mountains, Kenia and Aberdare. *Viola Emini* R. E. Fr. and *V. abyssinica* Hook. f. exclude one another from adjacent plant associations, both being strictly specialized to their respective associations.—*O. Heilborn.*

401. Gates, F. C., and M. C. Sewell. **Tillage and weeds.** Ecology **6:** 138–142. *1 pl.* 1925.—Under Kansas winter wheat field conditions, early tillage treatment, especially plowing, whether followed by later treatment or not, favors the development of such weeds, as smartweed, rather than such grasses as crab grass, during the fallow period. No treatment or late treatments, on the other hand, favor the extensive development of crab grass at the expense of weeds of the smartweed type.—*Author's summary.*

402. Gaume, R. **Aperçu sur quelques associations végétales de la forêt d'Orléans (Loiret). [Plant associations of the Orleans forest.]** Bull. Soc. Bot. France **71:** 1194–1207. 1924.—This forest of 40,000 hectares, developed on a sterile sandy clay with many ponds due to the

impervious soil, is composed principally of *Quercus sessiliflora*, a calcifuge. The author has here reported the first associational study of the area recognizing and describing: (A) Aquatic associations characterized by (1) *Myriophyllum alternifolium*, (2) *Scirpus lacustris*, (3) *Heleocharis palustris*, and (4) *Carex stricta;* (B) Xero-mesophyte oak forest at times degenerate and replaced by heaths and plantations of *Pinus silvestris;* (C) Moors and heaths including (1) *Ulex nanus* heath, (2) *Agrostis canina* swamps about the ponds, and (3) *Cicendia filiformis* on dry banks; and (D) Associations of crop plants.—*J. Beauverie (translated).*

403. Gidon, F. **L'ancienne steppe néolithique de la campagne de Caen. Origine de la flore. Datation des tumulus par des espèces résiduelles. [The ancient neolithic steppe of Caen. Origin of flora. Dating the mounds from residual species.]** Bull. Soc. Bot. Normandie 7th Ser. 6: 36–46. 1923 [1924].—Among other species *Thalictrum minus, Anemone Pulsatilla, Coronilla minima, Teucrium montanum, T. chamaedrys, Phleum Boemeri, Libanotis montana, Hippocrepis comosa,* and *Phyteuma orbiculare* are found on the mounds (tumulus) of Condé-sur-Ifs (Calvados). These species, located in the xerophilous and calcareous grass land, have probably been propagated in this region from neolithic times. Thus they permit the fixing of the date of formation of the mounds.—*M. Denis (translated).*

404. Gleason, Henry Allan. **The structure of the maple-beech association in northern Michigan.** Papers Michigan Acad. Sci. 4: 285–296. 1924 [1925].—From the study of several typical areas by the quadrat method it is concluded that: "The hardwood forest of the region is dominated by sugar maple [*Acer saccharum*], with beech [*Fagus grandifolia*], birch [*Betula lutea*], elm [*Ulmus americana*], and basswood [*Tilia americana*] as important codominants, the proportions of each depending upon the available moisture.—The flora of the association included some 200 species of vascular plants, of which about a score are regarded as characteristic, and of which many others are chance invaders from neighboring associations or relicts of an earlier occupation of the land by coniferous forest. Hemlock [*Tsuga canadensis*] belongs in the latter category.—The hardwood forest is still young historically and may have attained its full ecological dominance only 1 generation (about 3 centuries) ago.—*Author's summary.*

405. Graebner, P. **Die Heide Norddeutschlands. [The heather fields of northern Germany.]** In: **Die Vegetation der Erde. Vol. 5.** *2nd ed. 277 p. 78 fig., map.* Wilhelm Engelmann: Leipzig, 1925.—The new edition has been enlarged in most chapters. The following are the principal data presented: The concept of heather fields from a plant geographical standpoint; the geographical distribution of the heather fields and their plants in northern Germany; the origin of the heather field formations; their formation from the forest, from bare sand and from different marshes; the changes due to cultivation, burning and pasturage; the dependence of heather fields on climatic conditions; and the formation of heather fields in relation to other formations. Of the real heather fields he distinguishes 5 types. A special chapter is devoted to grass heaths of different types and facies occupied by various species of grasses. The forests found in these areas are those of pine and deciduous trees. Among the other formations considered in relation to the heather fields are the halophytes, meadows, swampy meadows, forests and prairies.—*J. C. Th. Uphof.*

406. Grinţescu, I. **Considérations géo-botaniques sur le mont Ceahlău (Carpathes orientales). [Geobotanical studies on Mount Ceahlau (Eastern Carpathians).]** Bul. Soc. Ştiinţe Cluj 2^2: 104–112. *2 pl.* 1924.—On Mount Ceahlau, *Pinus silvestris* is noted on the eastern slope at 1400-1500 m. *P. montana* plays an important role, extending up to the top at 1700 m. No true alpine zone is developed but in the open spaces in the pine forest and on bare places a lichen association of *Cetraria islandica, C. cucullata, Cladonia silvatica* and *Thamnalia vermicularis* forms dry tundras resembling arctic communities. Another characteristic association is the moist tundra composed of mosses and including cushions of *Sphagnun acutifolium.*—*Al. Borza (translated).*

407. Harper, Roland M. **Some pinebarren bogs in central Alabama.** Torreya 22: 57–60. 1922.—The presence of small bogs caused by water which seeps continually on gravelly slopes is recorded for Chilton and Autauga Counties, Alabama, U. S. A. Among the list of species, *Sarracenia rubra, Drosera capillaris, Pinguicula pumila* and *Utricularia subulata* are noteworthy.—*Geo. D. Fuller.*

408. Harshberger, John W. **The differentials effective in the distribution of plants in the coastal plain.** Science 61: 529–531. 1925.—Some of the edaphic, geologic and physiographic differences in the several parts of the coastal plain are sketched and shown to correlate closely with differences in the flora. Characteristic species for such locations as Nantucket and Martha's Vineyard, Long Island, New Jersey pine barrens, and the Florida coastal plain are mentioned, with numerous examples of their relation to a definite habitat.—*C. J. Lyon.*

409. Hauman, Lucien. **La végétation des hautes cordillères de Mendoza.** [The vegetation of the high Cordilleras of Mendoza (Argentina).] Anales Soc. Cien. Argentina 86: 121–188. *17 pl., 7 fig.* 1918.—A scanty alpine vegetation on the Andes at elevations of 2,000–4,200 m. between 31–37 S. Lat., is described. During the growing season these regions are almost without rain, almost the entire water supply for the sparse vegetation coming from the melting snow and ice. Humidity and temperature are low and wind velocity is high and constant, factors that result in the absence of trees and in a notable abundance of tufted, rosette and cushion plants, *Adesmia trijuga* (a legume) in the form of shrubby cushions 30 cm. high, with tufts of *Poa chilensis* and *Stipa speciosa*, dominate large areas, forming scattered dots over the rocky landscape.—The vascular flora consists of 417 species, including 1 pteridophyte, *Cystopteris fragilis*, and one gymnosperm, *Ephedra*. Large genera are *Senecio* with 26 species, *Adesmia* with 16, *Calandrinia* with 15, *Astragalus* with 12, *Oxalis* with 10 and *Viola* with 9. The scarcity of Saxifragaceae, with 2 rare species, and the entire absence of Ericaceae and Primulaceae are worthy of notice. More than half the species (210) are regarded as belonging to the central Andes, 60 being endemic. Among the groups of endemics are 6 species of *Adesmia*, 2 of *Boopis* and 12 of *Senecio*. Other elements of the flora are the northern tropical with 16 species, basal Argentinian with 56, southern Andean with 10 species, the Patagonian with 73 and the cosmopolitan with 28.—*Geo. D. Fuller.*

410. Holmboe, Jens. **Einige Grundzüge von der Pflanzengeographie Norwegens.** [Principles of the vegetation of Norway.] Bergens Mus. Aarb., Naturv. Række 3. 1924–1925[3]: 1–54. 1925.—This description of the vegetation of Norway was primarily intended for the use of the 4th International Phytogeographic Excursion. A general review of the natural conditions and broad features of the vegetation is followed by a detailed account of different regions, and the changes caused by human activity. Finally an exhaustive bibliography is given.—*K. Münster Strøm.*

411. Holmboe, Jens. **Plantet og selvsaadd bøk paa Vestlandet.** [Planted and self-sown beeches in western Norway.] Naturen 1925: 166–182. *Fig. 1–8.* 1925.—According to the theories of Blytt, the beech should have disappeared from western Norway with climatic alterations, as there is now only a single natural occurrence, near Bergen; and the limit of natural distribution is now as far south and east as Grimstad. Other authors, however, regard the beech as a late immigrant both to southeastern and western Norway.—The author has made investigations upon the fate of the planted specimens in western Norway, and not only do they thrive well, but they have spread very much since the dates of planting, a strong argument in support of the late immigration theory.—*K. Münster Strøm.*

412. [Il'inskii, A. P.] Ильинский, А. П. **Опыт фо рмулировки подвижного равновесия в сообществах растений.** [A concrete definition of fluctuating equilibrium (équilibre mobile) in plant communities.] (Résumé in French.) Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. Republ. Russe] 20[2]: 151–166. 1923.—Plant communities exhibit various degrees of stability which result from the reactions of a certain number of antagonistic groups producing a condition approaching equilibrium. The communities of a formation which approach equilibrium most closely are those with the highest generic coefficient, a curiously stable coefficient. These communities exhibit very stable reactions between the representatives of different biological types, oscillating within narrow limits only, in conformity with the changes of climate. The greater number of the communities observed are far from a state of equilibrium. Really a new system of equilibrium is being worked out.—*E. Sinskaja (translated).*

413. Kelly, A. P. **Soil water of the New Jersey coast.** Ecology 6: 143–149. 1925.—The sea-beach is saline only under the immediate influence of the surf. Tests were made for

reaction and for chloride content. The ground-water of the front beach is alkaline, becoming acid quickly on the landward side.—*Herbert C. Hanson.*

414. [Knorring, O. Z.] Кнорринг, О. З. **Ботаникогеографические наблюдения на Памире в 1913 году.** [Phytogeographical observations in the Pamir in 1913.] Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. Républ. Russe] **22:** 1–24. 1923.—In this paper the author gives the following outline of the phytogeographical districts of the Pamir region: I. Alai-Tale: (1) Slopes exhibiting Artemesia-grass steppes, grass steppes, and in part meadow steppes of alpine character; (2) very high rubble ("Schutt") terraces with scanty xerophyllous plants; (3) hilly, old moraines of rubble and conglomerate with blind hollows, partly covered with the xerophyllous flora of rocky situations, but in the hollows and near small lakes, with meadows of subalpine character (*Trollius altaicus, Primula sibirica, Carex nitida* var. *aspera*, etc.); (4) the valley of the Kisil-su, at times overflowed, with meadows and saline areas (Salsboden) in which a comparatively rich flora grows; (5) the river bed of the Kisil-su and its tributaries, with sparingly distributed shrubs (*Smelovskia calycina, Parrya excapa, Potentilla nivea* var. *elongata*, etc.); (6) the quicksands, in part sand steppes with mixed flora (*Elymus dasystachys, Hordeum secalinum, Zizphora clinopodiodes, Acantholimon*, etc.).—II. In Pamir the author distinguishes (A) abundantly watered tracts (a) in the mountains: (1) High meadows with true alpine flora (*Primula nivalis, Allium monadelphum, Papavar alpinum, Draba Korshinskyi, Cobresia Schoenoides*, etc.); (2) meadows along the Bache (*Primula algrida, Polygonum viviparum, Kobresia* [*Cobresia*] *Schoenoides, Astragalus brachytropis, Aster flaccidus*, etc.).—(b) In the valleys are (1) meadows, mostly brackish (Salzig), with a fairly abundant grass flora along the streams (*Carex pseudophoetida, C. curaica* var. *microglochin, Elymus dasystachys, Atropis distans, Glaux maritima, Saussurea salsa, Triglochin palustris, Gentiana prostrata*, etc.,); (2) meadows beside the great lakes (Sor-kul) (*Carex melanantha, Primula algida* var. *sibirica, P. nivalis, Gentiana prostrata, Ligularia altaica, Swertia marginata, Pedicularis uliginosa, P. Oederi*, etc.).—(B) In the insufficiently watered tracts of the Pamir are to be distinguished (1) Stony summits of high mountains, without vegetation; (2) lower slopes with scanty flora and "hypshaltigen" soils (*Parrya flabellata, Astragalus libetanus, Hedysarum pumilum, H. cephaloles, Calamagrostis anthoxanthoides*, etc.); (3) hilly moraines with siliciferous soils and very sparsely distributed shrubs (*Acantholimon diapensioides, Artemesia rupestris, A. Skorniakowi*, etc.); (4) slopes (Schiefebenen) and flat declivities (Abhänge) with isolated specimens of *Eurotia ceratoides;* and (5) "Takyre" or smooth, flat clayey (thomige) surfaces which crack open into slabs, without vegetation or with only a sparing distribution of *Eurotia ceratoides*.—Of the 144 species collected by the author in Pamir, only 7 are endemic, while 15 occur on the lower deserts of Turkestan or also on the Kirgesen steppes. The remaining species belong to forms found on the high steppes of Tian-Schan, Alai and Persia.—*Frederick V. Rand.*

415. Kujala, Viljo. **Tervaleppä Suomessa. [The black alder (Alnus glutinosa) in Finland. A phytogeographical study.]** (German summary.) Communicationes Inst. Quaest. Forest. Finlandiae 7. *301 p. 17 pl.* 1924.—The geographical range of *Alnus glutinosa* in Finland is discussed with special reference to the altitude reached in different localities. Comparisons are made between communities of this tree in Finland and in central Europe. The conditions under which regeneration takes place seem to influence its occurrence and distribution. The records of *A. glutinosa* in Finland receive careful attention. The leading idea of the article is the concept that the individuals of a plant species form in nature concrete biological wholes, and species associations (Artvereine) are parts of these wholes endowed with relative independence (Artsiedlung).—*Y. Ilvessalo.*

416. Lebour, Marie V. **The food of young herring.** Jour. Marine Biol. Assoc. United Kingdom n.s. **13:** 325–330. 1924.—Herring hatch at the bottom and make their way to the surface, where food is most abundant, begin to feed before the yolk has entirely disappeared, at first on unicellular matter (diatoms, flagellates, and infusoria), larval mollusks, and small copepods, and as they grow live chiefly on copepods. *Paralia sulcata* is an important diatom in this connection, being eaten both directly and indirectly through some other small organism. Of flagellates, *Halosphaera viridis* was the only one observed.—*Marshall A. Howe.*

417. Linstow, O. von. **Die natürliche Anreicherung von Metallsalzen und anderen anorganischen Verbindungen in den Pflanzen. Versuch einer Übersicht über bodenanzeigende Pflanzen. [Metallic salts and other inorganic compounds in plants. A survey in soil-indicating plants.]** Repertorium Spec. Nov. Regni Veg. Beih. 31. *iv + 151 p.* Verlag des Repertriums: Dahlem b. Berlin, 1924.—Some 55 different types of plants are described, indicating as many different types of soil. Such plants as salt-plants, potash-plants and barium plants are recognized. The practical results that may come from such a study are pointed out and a bibliography is given.—*From author's abstract (translated).*

418. Lloyd, Blodwen. **Marine plankton of the Welsh coasts, with special reference to the vicinity of Aberystwyth.** Jour. Ecol. **13**: 92–120. *5 fig.* 1925.—This study deals with the temporal and spatial variations and with conditions affecting the same. Units of associations were distinguished and the data compared with records from other districts and with earlier figures from this place. The horizontal and vertical distribution is given, the former with reference to tide and to the mouths of rivers. The seasonal phases are (1) the spring, with a sudden rise in February and March with a Biddulphia maximum which is overlapped by a Chaetoceras phase in April, a Rhizosolenia phase in May and an increase of certain other forms in June; (2) the summer, short in duration with few diatoms and moderate zooplankton; (3) the autumn with a 2nd but smaller increase in diatoms; and (4) the winter, a monotonic phytoplankton. These phases are graphically represented and the phaenology of the chief species is given.—*Geo. D. Fuller.*

419. Ilvessalo, Yrjö. **Vegetationsstatistische Untersuchungen über die Waldtypen. [Statistical investigations on the vegetation of forest types.]** Acta Forest. Fennica 20. *1–73 p. 12 fig.* 1921.—The investigations in question pertaining to forest types were made in the southern half of Finland in even-aged, regular and clean forest stands. They show that the number of higher plant species to a sample plot is different in different forest types (presupposing the stand to be of the same age and equally dense throughout); and from the poorest to the best types it rises distinctly and regularly. It is shown, principally by graphs and with the assistance of correlation calculations and mean average values, that in studying the number of plant species in any chosen plant-community (at least in forests) a few plots will not suffice, even though they be large ($\frac{1}{8}$–$\frac{1}{4}$ ha.). The richer the community is in species and the more luxuriant its growth the larger the number of plots necessary for its analysis. Satisfactory results are not obtainable from small plots of a few square meters. Elongated sample plots have proved more satisfactory than square ones, but for heterogeneous types, rich in species, broad strips are most satisfactory.—*L. Ilvessalo (translated).*

420. McClure, F. A. **Notes on the Island of Hainan.** Lingnaam Agric. Rev. **1**[1]: 66–79. *6 pl., map.* 1922.—Traditions have reported much wealth of gold, incense woods, timber, and drug plants awaiting discovery in the little known interior of Hainan Island. The author made 2 expeditions to the interior of Hainan during 1921 and 1922. A brief geographical description of the island is given. Observations on the agricultural and industrial conditions and on the flora of the lowland and of the Red Mist, Loi Mother, and Five Finger ranges are recorded.—*Albert N. Steward.*

421. Montfort, C. **Die Wasserbilanz in Nährlösung, Salzlösung und Hochmoorwasser. Beiträge zu einer vergleichenden Ökologie der Moor- und Salzpflanzen. [The water balance in nutrient and salt solutions and bog water. A comparison of the ecology of bog and salt plants.]** Zeitschr. Bot. **14**: 97–172. *8 graphs.* 1922.—The plants whose water-balance was investigated were *Zea mays*, *Impatiens parviflora*, and *Phaseolus multiflorus*. For the first 2 under average atmospheric conditions the quotient T–A (Transpiration/Absorption) was generally over 1, the mean deficit for *Impatiens* being 5.55% of the transpiration. In diffuse daylight the brightness of the sky is very important. The effect of adding 1% $CaCl_2$ solution to Knop's was observed under controlled transpiration conditions. In this case a sudden and marked decrease of intake preceded a drop in transpiration, often resulting in wilting. Studies were also made of the effect of sphagnum extract on the water balance. The initial effects were somewhat masked, but did not involve an immediate decrease of intake. The secondary effect of toxicity, lessened absorption, was not evident for at least 24 hours, and often much later. When the transpiration was increased after 20 hours in the extract the

root activity was correspondingly increased. No effect on uptake or outgo is produced by transfer from nutrient solution to high moor water. No change of balance is evident after 2 days, and increase of transpiration operates as in nutrient solution. Comparison of the effect of strongly acid nutrients shows effects not to be accounted for osmotically. Wilting is prevented by a slower drop in the intake curve. After 18 hours the water "traffic" is so strongly reduced that the absolute deficit is less than in nutrient solution, although it is nearly $\frac{1}{3}$ of the transpiration. The water supplied, even with root system killed, is 2–3 times that in strong salt solution.—The author presents a critique of the halophyte problem since 1890, and discusses the present trend of physiological plant geography away from the laboratory into the field. Comparison of salt moor and high moor shows the high moor to be physiognomically xerophytic, but with osmotically very active roots. Salt moor plants are hygromorphic halophytes, but with osmotically inactive roots. Schimper's theory of physiological drought is considered untenable and further research both in field and laboratory are considered necessary.—*P. B. Sears.*

422. Mörner, C. T. **Några östliga växter å svensk mark.** [**Additional species in the eastern part of Sweden.**] Acta Florae Sueciae [Utgivare] **1**: 161–184. *Pl. 12–13. 3 fig.* 1921.—I. *Choerophyllum bulbosum* L. var. *Prescottii* (D.C.) Fr. This particular species is cited as being found by A. K. Cajander on the slopes and rocky banks. This was mentioned in a notice in the journal Luonnon Ystävä 1902, p. 313. The author has found it at Jarhois in Pajala on a visit to the South at Pello and Nestenkankas. Montell, a forester of the Royal Service, later saw it growing farther north near the station-area in northern Pajala.—(*Rev. in Bot. Notiser 1921: 147–148, translated by A. L. Bakke*).

423. [Nalivkina, E.] Наливкина, Е. **Очерк растительности Новгородской Сельско-Хозяйственной Опытной Станции. Новгород.** [Vegetation of the Agric. Exp. Sta. Novgorod.] *86 p. 9 fig. Map.* Novgorod, 1921.—The paper contains a description of the bog associations of a small area, with observations on the ecology of separate species, the suppressing action of the sphagnum cover on the higher plants, the influence of moisture, etc.—*E. Sinskaja.*

424. Nichols, G. E. **The terrestrial environment in its relation to plant life.** [In: Nichols, G. E., et al. **Organic adaptation to environment.** *xviii + 312 p. 1–43 p. 2 pl., 1 fig.* Yale Univ. Press: New Haven, 1924.—The conditions which go to make up the environment may be classified from 2 points of view, physiological and ecological. From the physiological point of view, they may be grouped more or less naturally into 5 categories, namely moisture conditions, temperature conditions, chemical conditions, and mechanical conditions. From the ecological point of view they may likewise be divided into 5 categories, namely climatic conditions, physiographic conditions, biotic conditions, anthropeic conditions, and pyric conditions. The relationship between the environment and plant life is discussed with reference to each of these 10 groups of conditions. In considering the coördination of the various environmental influences in their relation to plant structure and behavior, the author stresses the application of the principle of limiting factors, the law of the minimum, the law of physiological limits, Bancroft's law, and the law of compensating factors. The article concludes with brief discussion of the environment in relation to evolution.—*Author.*

425. Nyárády, E. I. **Contribuţiuni la cunoaşterea vegetaţiei şi florei muntelui Ceahlău.** [**Vegetation and the flora of the Ceahlău Mountain.**] Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **4**: 79–88. *4 fig.* 1924.—The timberline vegetation, alpine meadows, rock associations and the dry and wet tundra of the conglomerate areas of the eastern Carpathians are discussed. *Carex Dufftii*, and *Luzula pallescens* are mentioned as new for the entire Rumanian region.—*Al. Borza* (*translated*).

426. Olsen, Carsten. **Studies on the growth of some Danish agricultural plants in soils with different concentrations of hydrogen ions.** Compt. Rend. Trav. Lab. Carlsberg **16**. *1–21. 6 fig.* 1925.—Experiments were made with alfalfa, *Medicago lupulina*, barley, rye and buckwheat grown in a highly acid sandy soil rich in humus, the water extract of which showed pH 4.0 reaction. To this was added different quantities of finely pulverized $CaCO_3$ producing a variety of soils ranging in pH value from 4.00 to 7.50. For the alfalfa cultures, soils with pH values from 7.50 to 8.50 were also prepared by the addition of burnt lime. Plants

were grown in pots containing 4 kg. of soil and the series was run in triplicate. The results based on the weight of dry matter showed the optimum range of H-ion concentration, indicated in pH values, to be for alfalfa and *Medicago lupulina* 6.5–7.0; barley 6.5–8.0; rye 6.0–6.5 and buckwheat 6.0–7.0. Buckwheat and rye grew better in highly acid soils than did the other plants, giving a growth of 90% and 82%, respectively, in soils of pH 4.0 whereas alfalfa and *Medicago lupulina* gave only 13% and 16%, respectively. None of the plants showed any 2-topped growth curve such as has been reported by Arrhenius. It would seem from these experiments that in practical agriculture it is possible to give the soil too much lime.—*Geo. D. Fuller.*

427. Palmgren, Alvar. **Die Artenzahl als pflanzengeographischer Charakter; sowie der Zufall und die säkulare Landhebung als pflanzengeographische Faktoren.** [Species number as a phytogeographic character; also chance and secular elevation as phytogeographic factors.] Acta Bot. Fennica 1: 1–142. *2 maps.* (Also, simultaneously, as Fennia 46: no. 2) Helsingfors, 1925.—This paper sums up the principal features of the author's earlier publications (1915–1922) on his minutely exact studies of the vegetation of the Åland Islands. Following DeCandolle, he emphasizes the necessity of considering relative areas in comparing species numbers of any 2 phytogeographic regions; he states that he has found a definite and constant relation between area and species numbers. On the Åland Islands he finds an unusually high species number, considering area; there are 650 native spp. on the archipelago; introduced species raise the number to 750. There are 52 trees and shrubs; 133 grasses, sedges and rushes; the rest are herbs, including 40 pteridophytes. The total area of the archipelago is 1426.1 sq. km. Gotland, on the neighboring mainland, has only about 700 spp. on over twice the area. Among the causes for this condition, the author emphasizes the favorable geographical location for plant immigration, recent secular elevation (estimated to have taken place mainly within 4000 years and still continuing), the character of the terrain as a group of small islands with greatly increased total coast line, the mosaic-like division of the terrain; also insular climate, partly calcareous soil, etc. Other Baltic island groups, notably the Stockholmer Schären, are comparable. Åland has been exposed to plant immigration from the west, and its vegetation is more Swedish than Finnish. The species numbers in the several districts fall off progressively from west to east. Deciduous forests are found mainly on newest lands, near beaches; older and higher ground is held by conifer forest. The elevation of the land goes on rapidly enough so that a stabilized beach plant population is impossible. The highest species number in Åland is always found on the beaches. The author emphasizes the element of chance in plant distribution, citing especially the frequent absence of species from locations well fitted for their support and open to their invasion. —*Frank Thone.*

428. Pessin, L. J. **A simplified rainproof valve for porous porcelain atmometers.** Science 62: 85–86. 1925.

429. Pont, J. W. **Onderzoek op den osmotischen Druk in Correlatie met Groeiplaats en Groeivorm in Zuid-Afrikaansche Planten.** [Osmotic pressure in correlation with the habitat and growth forms of South African plants.] South African Jour. Sci. 21: 322–338. *2 fig.* 1924.—The object of the research was to ascertain the osmotic pressure of plants growing wild in the vicinity of Bloemfontein and to correlate the pressure with the growth form and habitat. The method used was the cryoscopic method adopted by H. H. Dixon and W. R. G. Atkins. A table is given of the osmotic pressure of the plants and this pressure, expressed in atmospheres, shows the following correlations with the growth forms: Mesophanerophytes and microphanerophytes 16, nanophanerophytes 13, chamaephytes 12, hemicryptophytes 11, geophytes 9, helophytes 7, therophytes 10 and stem succulents 7. The correlation between habitat and osmotic pressure was not marked.—*Author.*

430. [Ramenskii, L. G.] Раменский, Л. Г. **Основные закономерности растительного покрова.** [Principal regularities observed in the vegetative cover.] *37 p.* Voronesh, 1925.—When working under natural conditions (chiefly on meadows, less on swamps, steppes, forests and lakes) a special method of estimating the stand of grass, was applied and the extensive material was treated according to the very original trend of the author's ideas. The fundamental principles were: The idea of movable equilibrium; the separation of ecology

from topology; the rule of the continuity of the vegetative cover; the rule of the ecological individuality of the different species; and the dependency of the vegetative cover on historical factors.—*E. Sinskaja.*

431. Romell, Lars-Gunnar. **Växttidsundersökningar å tall och gran. [Rate of growth of the pine and the spruce.]** (French résumé.) Meddel. Statens Skogsförsoksanst. **22**: 45–124. *30 fig.* 1925.—At 9 different stations in Sweden, extending over about 11° of latitude, groups of pine [*Pinus sylvestris*] and spruce [*Picea excelsa*] trees were measured for increase in height and diameter at short intervals during the growing season. The results are reduced to graphs and many comparisons made between the 2 species and between results at various stations. Among the results obtained the following seem most significant: The date of the initiation of growth of the pine exhibits a retardation of 3⅓ days for each degree of north latitude, the beginning and rate of growth being in general closely correlated with temperature although there was little correlation between growth and temperature in any 1 year. In the south the pine begins growth decidedly earlier than the spruce, a difference that disappears towards the north. The amount of increase in height seems to be determined by the conditions which affected nutrition during the previous year. Increase in thickness begins several days later than increase in height. The period of increases in height varies from 41 to 47 days, that of increase in thickness from 46 to 113 days.—*Geo. D. Fuller.*

432. Setchell, William Albert. **Temperature and anthesis.** Amer. Jour. Bot. **12**: 178–188. *4 fig.* 1925.—The author studied the blooming period of plants growing on Mt. Tamalpais, California, where Weather Bureau records for temperature and moisture had been kept. He noted 5 successive waves of anthesis on the south slope at about 2400 feet altitude, one in January and February, one in April and May, one in June, one in July, and one in August and September. The mean temperatures for these periods are approximately 5°C. apart, and the mean maximum and mean minimum of each period are also about 5°C. apart. Evidence is presented that anthesis is dependent upon temperature rather than upon moisture or hours of daylight, and that there are definite points of critical temperature for anthesis. The similarity of these facts to those previously recorded by the author for aquatic plants is noted.—*E. W. Sinnott.*

433. Shimek, B. **The persistence of the prairie.** Univ. Iowa Studies Nat. Hist. **11**: 3–24. *Pl. 1–4.* 1925.—A critical study through many years of selected tracts in Iowa shows that areas originally prairie are naturally restored after having been cultivated and otherwise disturbed.—The prairie does not represent a transition state but is a climax flora in its own right. In the restoration of prairies the earlier transition stages contain various mixtures of plants determined by the character of adjacent floras. Certain native plants, termed prairie weeds, quickly take possession of disturbed areas and form the advance guard of the prairie flora. Certain introduced weeds assist in this process of restoration but disappear as the prairie association is renewed.—The prairie remnants still persisting in Iowa are sufficient to furnish seed for the restoration of undisturbed areas. Protected tracts such as state parks may be returned to prairie at slight expense.—The views that the prairie will disappear for all time if broken, and that with the cessation of fires the forest will take possession of prairie are untenable in the light of the behavior of these tracts studied and similar areas observed elsewhere.—*Robert B. Wylie.*

434. Shreve, Forrest. **Ecological aspects of the deserts of California.** Ecology **6**: 93–103. *2 fig.* 1925.—The biological features of desert area are determined by a group of physical conditions and not solely by a low annual precipitation. The desert biota is characterized by a considerable number of features of structure, physiological activity, or behavior. The deserts of the world exhibit a great variety of physical complexes and a great variety of plant and animal life. The interior portion of California comprises some of the most arid regions of North America, as well as some truly desert areas in which there is a relatively abundant plant and animal life. The latter regions lie close to the lofty ranges of mountains which are responsible for the aridity of the interior; the former lie at a great distance from these mountains. The local distribution of plants in the desert is chiefly determined by small differences in moisture conditions, such as are maintained by site, shading, or texture of the soil. In the most favorable localities in the deserts of California it is possible to detect the

features that are due to these small differences. In the most arid localities such features are not to be found, and there is a monotonous but light cover of vegetation, extending without change over a great variety of sites. In localities lying between these extremes the character of the vegetation is frequently determined by the soluble content of the soil. The precipitation in the Californian deserts comes chiefly in the late winter and early spring, whereas the adjacent deserts to the east receive an increasing percentage of their annual precipitation in the summer months. This fact serves to explain the slow establishment of new individuals, the scarcity of succulent plants, and the absence of many species which are abundant in the contiguous desert areas.—*Author's summary.*

435. Stocker, Otto. (1) **Die Transpiration und Wasserökologie nordwest deutscher Heide und Moorpflanzen am Standort.** [The transpiration and water relations of northwestern German heath and bog plants.] Zeitschr. Bot. **15**: 1–41. *8 fig.* 1923.—(2) **Klimamessungen auf Kleinstem Raum an Wiesen-, Wald- und Heidepflanzen.** [Climatic studies on minimal areas of meadow, forest and heath plants.] Ber. Deutsch. Bot. Ges. **41**: 145–150. 1923.—(3) **Ökologischpflanzengeographische Untersuchungen an Heide-, Moor- und Salspflanzen.** [Phytogeographical studies of heath, bog and salt plants.] Naturwissenschaften **12**: 637–646. 1924.—The author has investigated Schimper's theory of the xerophytism of heath (heide) and bog plants using exact quantitative methods applied in the field. He determined, by weighing, the daily transpiration of 31 species from heaths, bogs and other habitats under the natural climatic conditions of northwestern Germany with the following results: (1) The transpiration of heath and bog plants varied, similarly to other plants, in response to varying atmospheric humidity. (2) In this region the soil of the bogs is never, and that of the heaths seldom, dry enough to cause decreased transpiration. (3) Bog plants transpire exactly the same when watered with bog water as when watered with tap water. (4) Relative transpiration $\left(100 \times \frac{\text{trans.}}{\text{evap.}}\right)$ is approximately 4 in *Calluna vulgaris*, *Erica tetralix*, and *Empetrum nigrum*, evergreens; 11 in *Viola palustris* and 17 in *Potentilla palustris*. (5) Transpiration per unit of leaf surface places the evergreen heath plants between xerophytes and mesophytes, the deciduous ones along with mesophytes and hydrophytes. (6) As these transpiration relationships seem poor criteria, the author proposes to use instead the ratio of daily transpiration to weight of roots. This places the transpiration rate of deciduous heath and bog plants along with mesophytes and hydrophytes and indicates for *Calluna*, *Erica* and *Empetrum* a doubly high rate caused by the larger number of leaves in these plants. These results indicate that Schimper's theory of the xerophytism of heath and bog plants is wrong. The leaf structure of the Ericaceae seems to be an adaptation to the very heavy winter storms of heath and bog regions rather than to decreased transpiration. Such adaptations for protection from wind the author terms "anemomorphs." The transpiration is found to be so great in *Calluna* that large Calluna heaths only form in regions of high humidity, and in regions of dry summers *Calluna* grows only where protected against winds by forests. Here the air in contact with the *Calluna* leaves it shown to be humid.—*Author (translated).*

436. Strøm, K. Münster. **Undersøkelser over ferskvandsalgers og planktons økologi og geografiske utbredeise.** [The ecology and geographical distribution of freshwater algae and plankton.] Nyt Mag. Naturvidensk **62**: (1–25). *Fig. 1–2.* 1924. [Oslo, 1925.]—An abstract of the English translation of this paper has appeared as Bot. Absts. 14, Entry 2424, 1925.—*Geo. D. Fuller.*

437. [Sukachev, V. N.] Сукачев, В. Н. **Фитосоцио-логические Очерки.** [A phytosociological study.] Журнал Русск. Бот. Обмества. [Jour. Soc. Bot. Russie] **6**: 69–79. 1921.—A record is made of an instance in Siberia, on the shores of Lake Baikal, where a forest association of *Pinus Cembra* has been replaced by a continuous mat of 2 mosses, *Hylocomium splendens* and *Hypnum Schreberi*. This elimination of a tree association by the excessive development of a bed of mosses is attributed to the exceptional humidity of the atmosphere. —*E. Sinskaja (translated.)*

438. [Tanfil'ev, G. I.] Танфильев, Г. И. **Главнейшие Физи-ко-географические районы Одесской губернии.** [The principal physico-geographical sections of the Province of Odessa.] *3 maps.* Odessa, 1924.—This is an attempt to divide a small territory into

sections based on relief, and on botanical and soil characters. The author makes many interesting observations pertaining to ecology.—*E. Sinskaja.*

439. Toumey, J. W., and P. W. Stickel. **A new device for taking maximum and minimum soil temperatures in forest investigations.** Ecology 6: 171–178. *6 fig.* 1925.—Defects in the usual method of using standard maximum and minimum thermometers in soil temperature studies are indicated. A better method is to excavate a soil well 1½ feet wide by 5 feet long. A framework is placed in the well. A double cover with a 3-inch air space between, encloses the well. One end of the well is faced with boards with openings at required depths through which borings with a 2-inch auger parallel with the soil surface are made to a distance of 2 or more feet. Maximum and minimum thermometers are attached to a special device and inserted in the borings. Two series of studies of obtaining soil temperatures by 3 methods were made and the results secured indicated by graphs. It appeared that thermometers placed in borings from soil wells gave more reliable data. By this method the soil and vegetation above the instruments are undisturbed. The cost of installation is small but the method is not usable in very rocky soil, where soil boxes will have to be employed.—*T. J. Fitzpatrick.*

440. Townsend, C. W. **Beachgrass.** *xii + 318 p. 42 pl.* Marshall Jones Co.: Boston, 1923.—This is a general account of the sand dunes in Essex County, Massachusetts, U. S. A.—*O. A. Stevens.*

441. Vernadsky. **Sur la pression de la matière vivante dans la biosphère. [The pressure of the living matter of the biosphere.]** Compt. Rend. Acad. Sci. Paris **180**: 2079–2081. 1925—An analogy is drawn between the gas pressure of molecules and the population of the world, that is, the sum total of living things. The latter is dependent on the rate of reproduction. A mathematical expression is given, based on the number of days following the first division (in unicellular forms), the number of divisions of the initial cell in 24 hours, the number of individuals formed by the division of the initial cell, and the progeny in *n* days. The measure of the pressure of a given organism is expressed in the form of a constant which differs with different species. Constants are given for various species of cryptogams, phanerogams, birds, protozoa, insects, and mammals.—*C. H. Farr.*

442. [Vinogradov-Nikitin, P. Z.] Виноградов-Никитин, П. З. **Некоторые наблюдения над жизнью деревьев.** [Observations on the life of trees.] Известия Тифлисского Государственного Политехнического Института. [Bull State Politech. Inst. Tiflis] **1**: 192–201. 1924.—The causes of false rings in wood is first discussed. Then observations on the phenomenon of "conjunction" of roots in tree and shrub associations are recorded. In thorn thickets (*Prunus spinosa*), occurring in forest openings in Transcaucasia, colonies are often formed by the subterranean union of the roots. A fusion of roots is also observed in *Rhus cariaria* and other shrubs. The life of the trees in a forest association is thus considerably more complex than is usually thought, as the separate individuals may form themselves into groups and colonies whose members are somewhat interdependent in the matter of supplementary food supplies, in mechanical support and in the economical use of both subterranean and aerial space. Thus the younger generation may obtain more favorable conditions of temperature, light and moisture.—*E. Sinskaja.*

443. Visher, Stephen S. **Tropical cyclones from an ecological viewpoint.** Ecology 6: 117–122. 1925.—Tropical cyclones are important ecologically in 8 main ways: (1) The violent winds uproot plants, break off branches and leaves, and carry away loose objects. (2) The abnormal direction and velocity of the winds aid in the dispersal of flying animals. Hundreds of dragonflies have been driven the 700 miles from Sumatra and Java to Cocos-Keeling Island. (3) The huge waves and strong currents break off large blocks of coral and must be of considerable importance. (4) They induce much of the rainfall of the tropics. During the passage of a typhoon in Baguio, near Manila, 46 inches fell in 24 hours, and in 4 days 88 inches fell. (5) The torrential nature of much of this rainfall causes flooding. (6) Radical changes in temperature, humidity, and salinity are produced. (7) The local destructiveness of cyclones is frequently very great. In the Swatow typhoon of August 3, 1922, 50,000 people were killed in a small area. (8) Cyclones are considered by the author to favor the formation of new species because the sudden changes in temperature, humidity, and salinity may

cause mutation and because the wide dissemination of species by wind and water leads to hybridization.—*Herbert C. Hanson.*

444. Watt, A. S. **On the ecology of British beechwoods with special reference to their regeneration. II. The development and structure of beech communities on the Sussex Downs.** Jour. Ecol. **13**: 27–73. *4 fig.* 1925.—*Fagus silvatica* in forest stands begins to seed at 60–80 years of age and produces full crops at irregular intervals of 5-8 years, there being some correlation between full seeding and weather. Reproduction comes entirely from the product of years of full seeding. The seed is but slightly mobile so that with breaks in the canopy beech seedlings form a zone about the area.—A beech forest often begins with a mixture of ash and beech, the latter being gradually reduced to not more than 10% of the stand. During this change there is also a change in the ground cover from (1) a bare ground stage, (2) an *Oxalis acetosella* stage, to (3) a shrub stage with *Rubus fruticosus* dominant. Four similar but distinctly different series are distinguished and analyzed. It is concluded that these 3 successive stages in the ground flora are partly determined by root competition which becomes progressively less severe with the development of the forest until it finally permits the establishment of a shrub undergrowth.—As an appendix the author discusses the status of *Acer pseudoplatanus* which is often in competition with the ash and beech. This introduced species produces mobile seed abundantly and annually after it is 40 years old. The light tolerance is between that of the beech and ash. When the 3 species occur together it seems that the ash is gradually replaced by *Acer* which continues as a rival of the beech for an indefinite time. (See also Bot. Absts. 13, Entry 106; 14, Entry 2381.)—*Geo. D. Fuller.*

445. Williams, C. B. **Bioclimatic observations in the Egyptian desert in March 1923.** Ministry Agric. Egypt. Tech. & Sci. Serv. Bull. 37. *1–18. 10 fig.* 1924.—This report gives the conditions of temperature, humidity, evaporation and other climatic factors in Wadi Digla, a narrow ravine in the Egyptian desert 9 miles southeast of Cairo. The surface temperature of the sand varies from 43.6° to 6.5°C. With these are compared temperature in air, in shade and sun, under rocks, in caves and at various depths, in the soil the results showing very wide variations of habitat conditions within the limits of the ravine.—*Geo. D. Fuller.*

446. Woodard, J. **Factors influencing the distribution of tree vegetation in Champaign County, Illinois.** Ecology **6**: 150–156. 1925.—The author states that probably the most important factors influencing the distribution of trees in this district are (1) destruction of prairie sod by stream erosion and shading, and (2) protection from the drying west and southwest winds. Probably the cause of soils becoming lighter in color after they have been occupied by trees is due to acids in the soil.—*Herbert C. Hanson.*

447. Wylie, Robert B. **Experiences of a botanist in New Zealand.** Univ. Iowa Studies Nat. Hist. **10**: 283–298. *Pl. 49–51.* 1924.—Observations are given on the vegetation and agriculture of North Island, New Zealand.—*Author.*

448. Wylie, Robert B. **Some experiences of a botanist in Fiji.** Univ. Iowa Studies Nat. Hist. **10**: 142–153. *Pl. 25.* 1924.—A general account of the natural vegetation and observations on the cultivated plants and agriculture of Vitilevu Island, Fiji.—*Author.*

STRUCTURE, BEHAVIOR SYMBIOSIS

449. Adinarayana Rao, K. **Casuarina root nodules and nitrogen fixation.** (Preliminary contribution). Year Book Madras Agric. Dept. **1923**: 60–67. 1924.—The author confirms the presence of N-fixing organisms in Casuarina nodules, previously found by Barber, Narasimhan and others.—*P. S. Jivanna Rao.*

450. Allan, H. H. **Induced hydathodes in a New Zealand Veronica.** New Phytol. **23**: 222–224. *Fig. 1–3.* 1924.—*Veronica amplexicaulis* grown under conditions of excessive soil moisture, atmospheric humidity, and shade produced somewhat smaller and much thinner leaves than the normal. Numerous capitate hairs which functioned as hydathodes developed on both surfaces.—*I. F. Lewis.*

451. Costantin, J. **Une vieille culture asymbiotique au Museum. [An old asymbiotic culture in the Museum.]** Compt. Rend. Acac. Sci. Paris **180**: 1806–1808. 1925.—The report is made that *Psilotum* has been cultivated asymbiotically for 132 years.—*C. H. Farr.*

452. Davy de Virville. **Sur les relations biologiques entre une Hépatique (Lophocolea bibentata Nees) et diverses Muscinées.** [The biologic relationship between a liverwort and various mosses.] Compt. Rend. Acad. Sci. Paris **180**: 391–393. 1925.—Five species of mosses and also another liverwort, *Plagiochila* sp., are found associated with this species of *Lophocolea*. The rhizoids of the liverwort are attached to the surface of the cells of the moss leaves. It is thus a type of climbing liverwort. By experiments with intravital staining with methylene blue it is found that there is a nutritive relationship between the 2 organisms as well. It is regarded as a symbiosis, or perhaps even as a true parasitism.—*C. H. Farr.*

453. De Wildeman, E. **Quelques mots sur la myrmecophilie chez le Grumilea refractistipula De Wild. (Psychotria refractistipula De Wild.).** [Myrmecophily of G. refractistipula.] Ann. Soc. Sci. Bruxelles **42**[1]: 281–286. 1923.—This paper deals with the classification of myrmecophily in plants and the position which *Grumelia refractistipula* holds in this relationship. In this plant the stipules are transformed into domatia as in *Macaranga saccifera*, by a species of *Coccideae* which some investigators claim are placed there by the ants. In this case the ants are indirectly responsible for the transformation of the stipules into domatia.—*Hugo L. Blomquist.*

454. [Elenkin, A. A.] Еленкин, А. А. **Закон подвижного равновесия в сожительстве и сообществах растений.** [The law of fluctuating equilibrium (équilibre mobile) in symbiosis and plant associations.] (Resumé in French.) Известия Главного Ботанического Сада Р. С. Ф. С. Р. [Bull. Princip. Jard. Bot. Républ. Russe] **20**[2]: 75–121. 1923.—The phenomena of close symbiosis and those of plant associations are quite identical. Instances of close symbiosis ought to be considered the original causes of plant association and for that reason should be included in courses in plant ecology. A detailed examination of such cases of symbiosis is all the more important since they demonstrate clearly the law of fluctuating equilibrium which rules the life of each association.—*E. Sinskaja (translated).*

455. Groves, J. **Chara and mosquito larva.** [Rev. of: Macgregor, Malcolm E. **Tests with Chara foelida and C. hispida on the development of mosquito larvae.** Parasitology **16**: 382–387. 1924.] Jour. Bot. [London] **63**: 56. 1925.—After detailing his experiments Macgregor says: "I feel certain that Chara can have no generally useful application in anti-mosquito measures."—*Frederick V. Rand.*

456. [Il'inskii, A. P.] Ильинский, А. П. **Эколого-морфологические этюды.** [A study in ecological morphology.] Журнал Русск. Бот. Общества. [Jour. Soc. Bot. Russie] **6**: 49–55. 1921.—The author describes 2 new forms of *Trientalis europaea* and 1 new form of *Maianthemum biflorum* which should be regarded as the result of abrupt changes in the conditions under which the plants grew during the preceding year. While growing some typical forms of *T. europaea* in full sunlight the author was able to observe the origin of its form *ramosa*. Under similar conditions *Lysimachia vulgaris* was able to produce a form *stolonifera*.—*E. Sinskaja (translated).*

457. Melin, Elias. **Untersuchungen über die Larix-Mykorrhiza II. Für weiteren Kenntnis der Pilzsymbionten.** [Studies on Larix mycorhiza II. The fungal symbionts.] Svensk Bot. Tidskr. **19**: 98–103. 1925.—Experiments were made in order to obtain synthetic mycorhiza on roots of *Larix europaea* and *L. occidentalis*. *Boletus variegatus*, *B. luteus*, *Cortinarius camphoratus*, *Amanita muscaria* and *Tricholoma psammopus* were found to form mycorhiza on *Larix europaea*, while experiments with *Boletus badius* and *Amanita rubescens* gave negative results. The author had already shown *Boletus elegans* to be a mycorhizal fungus on *Larix europaea*. *Tricholoma psammopus* is probably a specific larch symbiont, as in nature it seems to occur exclusively on that species. The other species form mycorhizas on other trees as well. Apparently a large number of fungi form mycorhizas on larch. Most of the fungi investigated reacted favorably to the roots, being much more vigorous there than in pure cultures. Additional experiments were made with *Boletus elegans* and *B. luteus* on *Larix occidentalis*, with positive results.—*O. Heilborn.*

458. Meyrick, Edward. **Wegener's hypothesis and the distribution of micro-lepidoptera.** Nature **115**: 834–835. 1925.—The food plants and distribution are discussed. The writer believes that there was better connection between Africa and South America then between Australia and New Zealand and that this was probably equatorial.—*O. A. Stevens.*

459. Pearsall, W. H., and Alice M. Hanby. **The variation of leaf form in Potamogeton perfoliatus.** New Phytol. **24**: 112–120. *Fig. 1.* 1925.—The length-breadth ratio of leaves of *P. perfoliatus* varies from 1.5 to 6.0. Soil analyses suggest, and experiments with Shive's 3 salt solution modified by the addition of $Ca(NO_3)_2$ or K salts show, that the broad form of leaf is due, at least in part, to a Ca-rich soil, the character of the water being relatively unimportant. The extreme variability of leaf form in the species studied is due to variation under natural conditions of (1) light intensity and duration, (2) Ca content of the soil, (3) the ratio of K to Ca in the soil if little Ca is present. Excess of Ca causes the leaf initial to produce about $2\frac{1}{2}$ times as many cells as a similar initial in excess of K. It is suggested that this and other differences are due to the effects of the chemical environment on the cell wall. The effects of low light intensity are similar to those of excess of K, but much less extreme.—*I. F. Lewis.*

460. Savageau, C. **Sur la naturalisation en France d'une Floridée australasienne (Asparagopsis armata Harv.) et sur ses ioduques. [The naturalization in France of Asparagopsis armata, from Australia, and its "ioduque."]** Compt. Rend. Acad. Soc. Paris **180**: 1887–1890. *Fig. A, B.* 1925.—The term "ioduque," is applied to brown bodies, 1 or 2 of which are present in most cells.—*C. H. Farr.*

461. Skovgaard, P. **Hedeplantagernes Fugleliv og lidt om Plantagernes Betydning for Bevarelsen af vore Fuglearter. [The bird life of the heath plantations and the significance of the plantations in regard to the conservation of our birds.]** Dansk Skovfor. Tidsskr. **1925**: 190–204. *13 fig.* 1925.—In the last 50 years the heath plantations have introduced a new factor in the bird life of the land, increasing the number of species. Plantations made on cuttings in forests reduce the number of birds.—*W. H. Meyer.*

462. Suter, Russel. **Pollution and natural purification in the Ohio River.** (A review of U. S. Public Health Service Bull. 143.) Jour. Amer. Water Works Assoc., **13**[3]: 314–322. 1925.—The writer reviews in detail the results of the bacteriological studies made on the self-purification of the Ohio River and recommends that an attempt be made to derive the true colon death rate from the fundamental data collected.—*H. B. Hommon.* (*Public Health Engineering Absts.*)

VEGETATION

463. Benoit, Raymond. **La végétation de la Guyane française. [The vegetation of French Guiana.]** Bull. Soc. Bot. France **71**: 1169-1177. 1924.—This country has a moist climate with a temperature very constantly near 27°C. The regions of vegetation are (1) the muddy flat coast almost at sea level; (2) the long rivers whose banks are daily flooded at tides; and (3) terraces rising to 700–800 m., formed of laterite from the decomposition of various rocks among which limestone is very scarce. The forests are most luxuriant on the drier areas that are never inundated. The dominant trees are mentioned and described as being 30–40 m. tall, with straight stems and rarely any branches below 25 m. The flowers too are confined to considerable heights. Some possess buttresses. Trees of 20–25 m. constitute a lower stratum. They too are very straight but often flower when only a few meters high. Lianas are abundant and add to the density of the main canopy. Epiphytes, shrubs and mosses are scarce. This with the relative absence of dead material makes the forest easily penetrable. Shrubs are more abundant where conditions are less favorable for forests, giving a more open stand.—In regions with standing water during a portion of the year, undergrowth and epiphytes are more numerous. Some of the latter send down roots that eventually enter the soil, as in *Clusia.* Strangling figs (*Ficus* spp.) also occur. Parasitic seed plants are rather rare. Jungles with lianas and herbaceous plants develop along the river banks and along brackish and salt waters are fringes of mangroves. With man's destruction of areas of forest, secondary vegetation quite different from the original stand develops. Rapidly growing tree species with soft, light colored wood come in, to be very gradually replaced by slower growing trees with harder, more durable wood.—*H. des Gayets* (*translated*).

464. Borza, Al. **Noui contribuţiuni la cunoaşterea vegetaţiei şi florei Insulei Şerpilor. [The vegetation and flora of the Island of Serpents.]** Bul. Soc. Ştiinţe Cluj **2**[2]: 113–132. *2 fig.* 1925.—In April, 1924, this little island in the Black Sea was found covered with green grass

and there was added to the species already recorded, *Ornithogalum refractum* W. K., *Valerianella costata* (Slev.) DC., and *Taraxacum megalorrhizon* (Forsk) Hand. Mzt. On the beach were found remains of *Salix* sp., *Phragmites* and *Trapa natans* indicating that the currents from the Danube delta, 45 km. away, were of importance in determining the vegetation of the island. The list of seed plants shows 20 ubiquitous species, 8 Pontical, 8 Mediterranean and 9 adventitive. The vegetation exhibits decided seasonal variations. Among the grassland communities, only the *Bromus* prairie shows any considerable advancement, the *Calamagrostis*, the *Matricaria* and the *Rumex patientia* communities being in early stages of development. Changes in the vegetation during the 83 years of record have been due to numerous annuals and to the depredations of sheep.—*Author* (*translated*).

465. E[rdtman], O. G. E. [Rev. of: Regel, K. **Die Pflanzendecke der Halbinsel Kola. Lapponia Varsugae.** (**Vegetation of the Peninsula Kola [Russia].**) Mem. Faculte Sci.Univ. Lithuanie *xxiv* + *246 p. 12 fig.* Kovno, 1922 [1923].) Svensk Bot. Tidskr. **18**: 521–522. 1924.

466. Oliver, W. R. B. **Vegetation of Poor Knights Islands.** New Zealand Jour. Sci. and Tech. **7**: 376–384. *3 fig.* 1925.—The Poor Knights are 2 islets 15 miles east of the North Auckland Peninsula. A century ago a few Maori lived on the southern islet, and left pigs behind them on returning to the mainland. Apart from this the islets are in a primeval state. The effect of the pigs on the southern islet has been to wellnigh extirpate many plants and prevent regeneration. Over 120 species of ferns and flowering-plants were collected. There are no conifers, and many of the common mainland trees are absent, but the islets constitute a natural museum for many species rare on the mainland. Succulence, large size of leaves, and prostrate habit are noticeable in certain species, when compared with the same species on the mainland. The communities briefly described are: fall forest, with numerous species; second-growth forest, with little undergrowth; Manuka (*Leptospermum ericoides*) forest; coastal scrub; *Phormium tenax* scrub, a burn-succession; reed swamp, with *Leptocarpus simplex* dominant. Details are given of many of the growth-forms. *Hebe Bollonsii* and a species of *Xeronema* are endemic. For the latter the name *Xeronema Callistemon* n. sp. is proposed. It forms large tussocks 5 feet or more in diameter, with flowering stems 3 feet or more high. The flowers are bright red. It is closely allied to the only other known species of *Xeronema* from New Caledonia.—*H. H. Allan.*

FLORISTICS

467. Anonymous. **List of Missouri wild flowers according to time of blooming.** Missouri Bot. Gard. Bull. **13**: 59–70, 75–92, 95–109, 120–122. 1925.

468. Anonymous. **Plant immigrants of our local flora.** Missouri Bot. Gard. Bull. **10**: 48–52, 84–92. 1922.—Lists include 173 species as recently having become permanently established in the vicinity of St. Louis, Missouri, U. S. A.—*O. T. Wilson.*

469. Allorge, Pierre. **Etude sur la flore et la végétation de l'ouest de la France. 1. À propos des espèces atlantique de la flore française. [The flora and vegetation of western France. I. Atlantic elements.]** Bull. Soc. Bot. France **71**: 1183–1194. 1924.—This is a rather complete enumeration of the Atlantic species of the French flora. They are arranged in 3 categories: (1) Euatlantic, those species occurring only in the European Atlantic Domain or in one of its sectors or being very rare elsewhere; (2) Subatlantic, those species that have their maximum frequency in the Atlantic Domain but extend beyond its limits into the Mediterranean region or into Central Europe, becoming more and more sparse in their occurrence as they depart from their main area; and (3) Euryatlantic, those species which occur in both the European Atlantic Domain and in the American Atlantic Domain.—*H. des Gayets* (*translated*).

470. Borza, Al. **Protecţiunea naturii în România. [The protection of nature in Rumania.]** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **4**: 1–24. *1 pl.* 1924.—The following species are enumerated as requiring protection in the provinces of greater Rumania: *Taxus baccata, Pinus Pallasiana, Leontopodium alpinum, Polygala siberica, Goebelia alopecuroides, Daphne Blagayana* and *Nymphaea Lotus*. Plant communities and localities are discussed and areas are indicated and mapped as suitable for preserves and parks.—*Author* (*translated*).

471. Daveau, J. **L'Aster squamatus (Sprengel) Hieronymus dans le bassin mediterranneen. [Aster squamatus in the Mediterranean basin.]** Bull. Soc. Bot. France **71**: 1065–1069. 1924 [1925].—This species widely distributed in America was unknown in Europe and Africa until 1905 when it was found in Tunis. In 1914 it was recorded for France, in 1919 for Algeria, in 1920 for Gran d' Agde and in 1924 for Maries de la Mer. It seems to adapt itself to all soils and all locations. The synonymy of the species is given and it is shown to be identical with the Mexican plant which was collected at 1800–2300 m. and with those collected in South America. Material from salt marshes shows distinctive characters.—*J. Chifflot (translated).*

472. Genty, P. A. **L'ilot granitique de Mâlain et sa végétation—Monographie phytostatique. [The granite isle of Malain and its vegetation.]** Bull. Soc. Bot. France **71**: 1069–1084. 1924.—This isolated outcrop of granite rock is 25 km. distant from the main mass at Morran. It has an elevation of 460 m. The author has studied its vegetation for 12 years and has found none of the plants which are characteristic of the main granitic area of Morran. Its vegetation comes partly from adjacent calcicolous flora and partly from that of neighboring siliceous clay. A complete enumeration of the plants gives 170 dicotyledons, 79 monocotyledons and 89 Cryptogams.—*J. Chifflot (translated).*

473. Grier, N. M. **The native flora of the vicinity of Cold Spring Harbor, New York. [U. S. A.]** Amer. Midland Nat. **9**: 245–256. 1924; 283–318, 384–437. 1925.—An annotated list is given which includes Schizophyta, Myxomycetes, Dinoflagellatae, Bacellariophyta, Algae, Fungi, Bryophytes, Pteridophytes and seed plants.—*Geo. D. Fuller.*

474. Grinţescu, I. **Botrychium virginianum (L.) Swartz în Transsilvania.** Bul. Soc. Ştiinţe Cluj **2**²: 21–22. 1924.—This circumpolar plant was discovered by I. Kiss near Săcărâmb, not far from his other Rumanian locality, Karlsdorf in the Banat.—*Al. Borza.*

475. Hanssen, Olaf, and Jens Holmboe. **The vascular plants of Bear Island.** Nyt Mag. Naturvidensk. **62**: 210–237. *Map.* 1925.—After reviewing the earlier work done since the 1st scientific expedition to the Island in 1827, a complete discussion of the vascular plants is given, including both the collections by Hanssen in 1923 and the work previously done by different authors, principally Swedish. The flora consists of 55 species, of which 3, namely, *Salix herbacea, Hippuris vulgaris* and *Rhododendron lapponicum*, have not yet been found on Spitsbergen. On the other hand, there are some arctic species not known on the European continent, so that the vegetation, in spite of its poorness, may be said to be intermediate between that of northern Norway and Spitsbergen. *Alopecurus alpinus, Poa arctica, P. alpina, Arctophila fulva, Dupontia Fisheri, Cerastium Regelii* and *Hippuris vulgaris* are new to the Island.—*K. Münster Strøm.*

476. Hocquette, Maurice. **Sur l'origine des plantes adventives du nord de la France. [Origin of the adventive plants of northern France.]** Compt. Rend. Soc. Biol. **91**: 1327–1329. 1924.—The majority of the adventives come from the Mediterranean region; the remainder from Central Europe, America, and Asia. Some have escaped from cultivation but most seem to have come in from ships or by the railroad. Strange as it may seem, very few plants were introduced during the World War.—*Oran Raber.*

477. Kujala, Viljo. **Laskelmia lehtipuiden lehtikauden pituudesta ja puiden kukkimisajoista Suomessa. [The length of the foliage period of broadleaved trees and the flowering time of trees in Finland.]** (German Summary.) Communicationes Inst. Quaest. Forest. Finlandiae **7**. *1–50.* 1924.—Making use of phenological observations on record from 1750, calculations of the average time of flowering and that of the opening and the fall of leaves at 167 observation stations are presented in the form of tables for the following species of trees: *Betula alba, Alnus incana, Alnus glutinosa, Populus tremula, Acer platanoides*, and *Tilia cordata.* In addition, the time of flowering has been tabulated for the following species of trees: *Sorbus aucuparia, Pyrus malus, Prunus padus, Pinus silvestris* and *Picea excelsa.*—*Y. Ilvessalo.*

478. Lidman, G. **Några anteckningar om Hälsinglands flora. [Contributions to the flora of Hälsingland (province in Sweden).]** Svensk Bot. Tidskr. **19**: 84–97. 1925.—A list of plant localities is given.—*O. Heilborn.*

479. Nyárády, E. I. **O plantă noua pentru Flora României. [A new plant for the Rumanian Flora.]** Bul. Inf. Grădinii Bot. Muz. Bot. Univ. Cluj **3**: 111–112. 1923.—*Ammophila*

australis (Mab. Rech.) Porta & Rigo was discovered by Cornel Gürtler in the dunes from Movila, in Dobrogea.—*Al. Borza.*

480. Paczoski, J. **Coronilla elegans Panc. na południowej krawedzi wyżyny Podolskiej. [C. elegans in the south Podolian heights.]** Acta. Soc. Bot Poloniae **2**: 302, 303. 1924–1925. —This plant, reported from the Bajtal forest district of Ananjew, in the state of Cherson near the border of Podalia, was formerly known from the Balkan Peninsula. It was classified by Ascherson and Graebner as *C. varia* L. from which it really differs decidedly. It was found at the bottom of a ravine in a forest of oak, hornbeam, ash and linden along with *C. varia* L. and *Orobus niger* L. and several western plants, such as *Doronicum hungaricum* Rehb.—*Author (translated).*

481. Panţu, Z. C., et Th. Solacolu. **Deux plantes nouvelles découvertes en Roumanie. [Two new plants in Rumania.]** Bull. Sect. Sci. Acad. Roumain **9**: 23–32. *3 fig.* 1924.—*Cyclamen durostoricum* n. sp. and *Agropyrum Brandzae* n. sp. are fully described with critical remarks and a description is given of the steppe association of Dobrogea in which they occur. —*Al. Borza.*

482. Pax, F. **Die Untergattung Euhieracium in Siebenbürgen. [The subgenus Euhieracium in Transylvania.]** Verhandl. u. Mitteil. Siebenbürgischen Ver. Naturwiss. **72–74**: 17–31. *1 pl.* 1922–1924 [1924].—The numerous species of this subgenus are enumerated and the Middle-European character of the Hieraciums of the East Carpathian Mountains is pointed out. The influence of the Balkan Mountains is seen in he presence of *Hieracium rotundatum, H. sparsum, H. Hoppeanum* and *H. Pavichii.* A phytogeographical analysis of the distribution, and a sketch of the probably post-glacial evolution of the very numerous intermediate forms are also given.—*Al. Borza.*

483. Samuelsson, Gunnar. **Växtlokaler från Västmanland. II. [Plant localities from Västmanland (province in Sweden). II.]** Svensk Bot. Tidskr. **19**: 1–48. 1925.—An extensive list of plant localities is given.—*O. Heilborn.*

484. Shimek, B. **The prairie flora on Manitoba.** Univ. Iowa Studies Nat. Hist. **11**: 25–36. *Pl. 5–8.* 1925.—A brief discussion is given of the prairie flora as it appears in a portion of southern Manitoba near the northern border of the prairie area. The vicinity of Carberry, about 100 miles north of Winnipeg, was chosen for study because of an earlier study of the flora of that region published by Christy (1887). This region was visited by the author in 1883 and 1884 when first being settled, and in 1920 when the prairie of the region was mostly under cultivation. The paper includes observations on the floras of swamp, forest, dune and prairie. Lists of prominent species are given for both the sand prairie and the more fertile prairie. Attention is given also to the weed flora both native and introduced, most of the latter having entered since the publication of Christy's list nearly 40 years ago.—*Robert B. Wylie.*

485. Steenis, C. G. G. J. van. **Een nieuwe vindplaats van Helianthemum guttatum Mill. in ons land. [A new locality of Helianthemum guttatum in the Netherlands.]** Nederland. Kruidk. Arch. **1924**: 138–147. *3 fig.* 1925.—*Helianthemum guttatum* Mill. was found near Bakkum in the Province of North Holland.—*J. C. Th. Uphof.*

486. Stewart, E. J. A. **Donald Patton. Additional notes on the flora of the Culbin Sands.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 27–40. *1 map.* 1924.—Although only the "Culbins Proper" have been examined in these latter visits the number of phanerogams recorded has been increased from 130 to 250 species. Increased recognition of the importance of mosses and lichens in the fixation of the sands has been compelled. A list of plants additional to those previously listed is appended.—*Thomas Swarbrick.*

487. Uphof, J. C. Th. **Die Kakteen in den Steppen des Südwestlichen Nordamerika. [Cacti in the deserts of southwestern North America.]** Gartenwelt **28**: 36, 107–108. *8 fig.* 1924.—A general ecological description is given of the occurrence and distribution of cacti in the southwestern U. S. A. and in some parts of Mexico. The figures show various cacti in their native state.—*Author.*

488. Vestergren, T. **Hybriden Agropyron litorale (Host) Dum. × repens (L.) PB i Norge.** Nyt Mag. Naturvidensk **62**: 245–247. 1925.—The hybrid, *Agropyron litorale* × *A. repens* was found in southeastern Norway, where the species, *A. litorale*, has not been

found, and the author regards it probable that the hybrid occurs alone, vegetatively spread by ballast or currents.—*K. Münster Strøm.*

489. Zimmermann, Walter. **Xerothermensiedlungen am südöstlichen badischen Jura-rand. [The dispersal of xerotherms in south-eastern Jura.]** Mitteil. Badischen Landesver. Naturk. u. Naturschutz **1**: 298–301. *Map.* 1924.—A phytogeographical description is given of this region in southwestern Germany. The author concludes from the present distribution of species that the majority of the xerotherms invaded the region gradually, rather than suddenly, after the glacial period. Their present dispersal seems to prove the existence of a warmer period between the glacial period and the present.—*Author (translated).*

FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 1, 10, 14, 157, 228, 242, 264, 288, 305, 306, 307, 311, 329, 333, 337, 345, 348, 354, 380, 384, 391, 397, 404, 405, 411, 415, 419, 420, 431, 433, 439, 442, 444, 446, 447, 457, 461, 463, 466, 477, 602, 652, 890, 891, 892, 893, 896, 1162, 1240, 1279)

490. Anonymous. **Лес, его изучение и использование. Второй лесной сборник промышленно-географического отдела К. Е. П. С. [Forests, their investigation and uses. Second forestry almanac of the Industrial-Geographical Section of the Commission for Studies of Natural Forces.]** *195 p.* Leningrad, 1924.—The almanac contains the following papers: A. A. Bitrikh and S. N. Nedrigailov, The forests of the northwestern region of Russia, (Part I, Natural-historical survey); A. A. Fock, Statistical data on the composition of the different forests of European Russia; A. A. Grigorjev, Succession of the forest-tundra formation in the western part of the Bolshesemelskaja Tundra; G. G. Doppelmayer, Social life of the forest and development of the forest fauna; V. V. Matreninsky, Forestry in England and her colonies. The papers of Bitrikh and Nedrigailov, and of Grigorjev are especially interesting from a general botanical point of view, as they give much information on the forest formations of the far North of Russia.—*E. Sinskaja.*

491. Anonymous. **Less forest, more floods.** New Zealand Life, New Ser. 4^2: 14. 1925.—Classification of all virgin country by scientific experts is urged so that enough shall remain under forest to protect the lands cleared for settlement.—*H. H. Allan.*

492. Anonymous. **Tree farming in North Canterbury, Amuri.** New Zealand Forest Mag. 4^5: 11. 1925.—A plantation of *Pinus radiata* 40–50 years old is estimated to yield 100,000 super feet of building timber per acre.—*H. H. Allan.*

493. Baker, Frederick S. **Aspen in the Central Rocky Mountain Region.** U. S. Dept. Agric. Dept. Bull. 1291. *1–46. Pl. 1–10, fig. 1–3.* 1925.—*Populus tremuloides* grows in even aged stands over large areas in western Colorado and central Utah. This bulletin describes its growth and silvicultural characteristics. Apparently it never comes up from seed in the region studied, but always results from sprouts, hence the sprouting capacity must be preserved. Experiments with cutting at various times of the year in stands of various ages indicate that adequate sprouting under all circumstances is the rule. Overgrazing, especially by sheep, appears to be virtually the only factor which prevents satisfactory sprout reproduction on cut-over areas. Growth is rapid at first, but slows down later, and few trees are over 150 years old. At that age decay is prevalent and destructive, even in the best stands. Aspen is extremely sensitive to local site variations and mature stands vary from 90 feet in height to mere thickets of brush. The wood is not extensively used in this region, but probably will prove of considerable value for special purposes.—*Author.*

494. Baker, Frederick S. **The construction of taper curves.** Jour. Agric. Res. **30**: 609–624. *Fig. 1–10.* 1925.—Curves showing the taper of trees of different size classes (diameter and height) are used by foresters in studying tree volume and in preparing volume tables. Such curves have usually been prepared heretofore according to a standard devised by Barrows, described in Proc. Soc. Amer. Foresters **10**: 32–40, 1915. This method of curve construction is open to grave errors, the most serious of which are described. The author develops a new method, based on the premise that all trees with the same form quotient

(diameter at ½ height divided by diameter at base) have the same form. This method requires only that the form quotient shall vary smoothly between the different size classes, whereas the previous method required the harmonization of the entire curve. Results can be obtained from a smaller amount of data, since only a few form classes need be recognized, the number depending upon the variation in form quotient between the different sizes of trees represented in the study. The measurements should be on a relative rather than an absolute basis. Diameters are expressed in terms of diameter at the base as unity, while heights are based on the total height of tree as unity. In this way, trees of different sizes, but the same form, may be thrown into the same class and averaged to give better weight to the particular form class under consideration. The relationship of form to diameter and height classes is worked out so that the form quotients of each size class are known.—A method is also described for making taper curves which can be applied to certain species whose form closely conforms to a paraboloid.—The study develops an empirical method of representing tree form, based upon the hypotheses that trees of a given species with the same form quotient are of the same shape from top to bottom, and that form varies regularly with changes in diameter and height.—*Author.*

495. Bates, Carlos G., and Jacob Roeser, Jr. **Relative resistance of tree seedlings to excessive heat.** U. S. Dept. Agric. Dept. Bull. 1263. *1–16. Fig. 1.* 1924.—This deals with 2 series of tests, made in 1919 and 1922, with seedlings of *Pinus ponderosa*, *Pinus contorta*, *Picea Engelmanni*, and *Pseudotsuga taxifolia*, to determine the resistance of seedlings to high temperatures when the factor of drought is eliminated. In the 1922 tests, which were more complete, the seedlings were tested 30, 46, 64 and 92 days after sowing. The results indicated that under laboratory conditions which approached natural field conditions, the wilting of all species was mainly in the nature of a collapse of the stem at the ground line. For seedlings 30 days old, a temperature of approximately 141°F. for 1 minute caused critical injury to all species. In all tests, Douglas fir seedlings were the most sensitive, especially at the low temperatures, while spruce came 2nd, at least at the higher temperatures. The order of heat tolerance (lodgepole pine, western yellow pine, spruce, and Douglas fir) closely approximates that assumed by Bates in studying the relation of transpiration rates to heat requirements. A free rate of transpiration offers greater protection from intense insolation than a more restricted rate. Extreme heat, though of short duration and rare occurrence, may be an important factor in preventing reproduction, and in limiting the natural habitats of the different species in the Central Rocky Mountains, where surface soil temperatures as high as 154°F. have been recorded. Because of individual variations, it was not possible to determine absolute wilting temperatures or to define the relationship between time of exposure and the temperature.—*J. Roeser.*

496. Eckbo, N. B., and M. H. Scott. **Weights of some South African grown woods, with special reference to the eucalypts.** Union of South Africa Forest Dept. Bull. 13. *1–9.* 1925.—A discussion of the method of determining specific gravity and the influence of weight on physical qualities is followed by detailed figures on specific gravity and weights of indigenous woods, both green and oven dried to 10% moisture content.—*C. F. Korstian.*

497. Escherich, K. [Rev. of: Barbey, A. **Traité d'entomologie forestière à l'usage des sylviculteurs, des beboiseurs, des proprieteurs de bois et des biologistes.** (Forest entomology.) *2nd ed. — p. 498 fig.* Paris, 1925.] Forstwiss. Centralbl. **47**: 391–392. 1925.—This is the only comprehensive work on the subject in French. A large number of photographs and considerable material on useful insects are new in this edition. Some of the recent literature on important insects has been overlooked.—*W. N. Sparhawk.*

498. Geete, Erik. **Om den nyaste barkspaden "Triumf."** [**The newest barkspade—"Triumph."**] Skogen **12**: 203–207. 1925.—A new forest tool combines both cant hook and barkpeeler.—*Henry I. Baldwin.*

499. Grenander, Tell. **Något om plantering a sidländ mark.** [**Planting on moist ground.**] Skogen **12**: 200–202. 1925.—To avoid excessive loss in plantations on marshy ground, use may be made of alder (*Alnus glutinosa*) which attains a large size in Scandinavia, or some form of mound planting should be used for pine and spruces. Planting on upturned turf which has been allowed to stand a year has given good results.—*Henry I. Baldwin.*

500. Keet, J. D. **Trees and shrubs for the bushveld portions of the Pretoria, Rustenburg and Waterberg Districts of the Transvaal.** Union of South Africa Forest Dept. Bull. 14. *1–20.* 1925.—Brief notes on climate, soil, natural vegetation, and the establishment and care of plantations are followed by a list of species considered suitable for these districts. General notes are given for the important species.—*C. F. Korstian.*

501. Korstian, C. F., and F. S. Baker. **Forest planting in the Intermountain Region.** U. S. Dept. Agric. Dept. Bull. 1264. *1–49. Pl. 1–7, fig. 1–7.* 1925.—This bulletin considers the difficulties of reforesting the exposed and poorly watered mountains of the Intermountain Region which must be kept forested to insure continuous and well-regulated water flow for widely extended irrigation systems on the plateaus and in the valleys. Direct seeding has been found to be out of the question. The rigorous site conditions make it imperative that only strong, well-developed, and evenly developed nursery-grown seedlings of native species be planted. Suitable sites must be carefully selected and much depends on the weather conditions following planting. The sites most essential for reforestation to protect watersheds are those in the high mountains, which are the very sites where relatively heavy stands of the greatest timber value can be grown.—*C. F. Korstian.*

502. Langford, E. **A magnificent plantation.** New Zealand Forest. Mag. 4[5]: 13. 1925. —Details of the growth of several exotic trees in the Homebush Plantation, Canterbury, New Zealand, are given.—*H. H. Allan.*

503. Petrini, Sven. **Skogsproduktion och räntabilitet.** [Forest production and profit.] Skogen 12: 177–188. 1925.—The failure of forestry calculations to show a rate of return on the investment comparable with other business ventures is because it is assumed that a start is made with bare ground, whereas most forestry operations begin with the cutting of mature timber. By taking account of thinnings and by distributing fixed charges during the rotation that are in keeping with actual practice, most forests can be shown to yield 5–7% on the investment.—*Henry I. Baldwin.*

504. Pritchard, G. H. **Celotex manufacture for Queensland.** Australian Sugar Jour. 17: 71–72. 1925.—It is believed that this artificial lumber, which is made from sugar cane at a plant near New Orleans (U. S. A.), will make satisfactory box material for Australian butter manufacturers. When used in house construction it results in cooler houses in Australia. Its utilization for a similar purpose in India is recommended.—*Nellie E. Fealy.*

505. Rabaya, Constantine. **The manufacture of charcoal by the Japanese process.** Australian Forest. Jour. 7: 96–100. 1925.—The Japanese process of making charcoal is described as the most efficient and economical of all the processes in use in the Philippine Islands.—*C. F. Korstian.*

506. Record, S. J., and G. A. Garratt. **Boxwoods.** Yale Univ. School of Forest. Bull. 14. *1–81. Pl. 1–8, fig. 1–3.* 1925.—The introduction covers the history of the use of boxwood (*Buxus*), and its substitutes. The following species are discussed in detail: (1) Turkish boxwood and others of the family Buxaceae, including *Buxus sempervirens, B. balearica,* Indian species, Chinese and Japanese species, and others; (2) West Indian boxwood, *Casearia praecox;* (3) Knysna boxwood and others of the family Apocynaceae, including *Gonioma Kamassi* and *Aspidosperma Vargasii;* (4) Siamese boxwood, *Gardenia* sp.; (5) San Domingan boxwood, *Phyllostylon brasiliensis;* (6) Venezuelan boxwood, *Esenbeckia Atata;* (7) dogwood, *Cornus florida;* and (8) Florida boxwood, *Schaefferia frutescens.* Keys for the determination of the boxwoods are included. Notes on the distribution and relative importance of the principal species in commerce are given, with botanical descriptions, scientific and common names, and descriptions and uses of the wood.—*H. H. Chapman.*

507. Romell, Lars-Gunnar. **Försök med klängning av gran- och tallkott vid olika temperaturer.** [Experiments with the cleaning of spruce and pine cones at different temperatures.] Skogen 12: 189–199. 1925. (Also, Flygblad Statens Skogsförsöksanstalt No. 34.)—Test extractions show that spruce seed is less sensitive to high temperature than pine, for a given period of heating. Where the arrangement of the kilns permits preliminary drying, temperatures up to 55–60°C. may safely be used to shorten the drying time to 6 hours. The greener the cones, the more gradually should the heat be applied, since seed are much more sensitive to heat injury when moist.—*Henry I. Baldwin.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 26, 38, 46, 110, 125, 126, 129, 130, 161, 176, 307, 309, 310, 367, 368, 488, 598, 641, 649, 689, 690, 691, 708, 709, 731, 797, 875, 881, 1171, 1234, 1286)

508. Anderson, E. G. **Genetic factors for yellow endosperm color in maize.** Papers Michigan Acad. Sci. **4**: 51–54. 1925.—After making a genetic comparison of the endosperm colors of the seed of maize studied by several investigators the author concludes that 3 major factors are involved in the production of yellow color. The deep yellow to orange color of the endosperm is controlled by a single dominant factor designated *Y*. This gene is located in a chromosome with the *Pl* gene for plant color, the *sm* gene for silk color, the *pm* gene for primitive sporophyte and the W_1, W_6 and W_5 genes for white seedlings. Light or pale yellow endosperm depends for expression on a dominant factor independent of *Y* and designated *Yp*. No linkage data have been published for the *Yp* factor but it is known to be linked with a a factor for pale green seedling color. (Demerec.) In addition to the 2 dominant factors involved in the production of yellow color there is a 3rd factor pair of which the dominant allelomorph produces a colorless endosperm imperfectly dominant to both deep and pale yellow. This factor has been given the designation *Wh*. No linkage data are available for this factor. Modifying factors are recognized but since they are not adapted for genetic work no attempt was made to differentiate them.—*J. H. Kempton.*

509. Babcock, E. B., and J. L. Collins. **Interspecific hybrids. Crepis capillaris (L.) Wallr. × C. tectorum.** Univ. California Publ. Agric. Sci. **2**: 191–204. *3 pl.* 1920. (See also Bot. Absts. 9, Entry 1295.)

510. Banker, Howard J. **Education and fecundity.** Jour. Heredity **16**: 57–59. 1925.—The article is a commentary on an article by S. J. Holmes that appeared in the Jour. Heredity for October, 1924. The writer shows from Holmes' data that, in general, a mother of high school education is 16% less fecund than a mother of common school education, while a mother of college education is only 4% less fecund than the high school mother. Hence "delayed marriage" due to time spent in acquiring a higher education appears to be a small factor in the low fecundity of the educated classes. It is suggested that education and fecundity are not directly related but that both are possibly functions of the social status of the family.—*Author.*

511. Beauverie, J. **Notes et rapports sur la séléction généalogique du blé en 1922–1923. [Reports and notes on the pedigreed cultures of wheat in 1922–1923.]** Bull. Office Agric. Rég. Massif Central, Clermont-Ferrand. 3. *1–72.* 1924.—This paper details the plan of the experiment station for testing wheat varieties. Comparative data for 1922–1923 on the various varieties and pure lines grown are given with special reference to susceptibility and resistance to yellow rust (*Puccinia glumarum*), to various vegetative characters, number of days between planting, flowering and harvesting, and to the effect of weather. The pedigreed lines of various varieties are listed as to origin, number of lines separated, and number discarded. A list of the wheat varieties in the station collection is given and the program for 1923–1924 is outlined.—*Orland E. White.*

512. Bryan, W. E., and E. H. Pressley. **Hard grain texture as a basis of selection for improving the quality of Early Baart wheat.** Jour. Amer. Soc. Agron. **17**: 440–443. 1925.—The hard strains are all about 5% higher in absorption and 2% higher in gluten than the soft parent. It was shown that in the case of hard Baart strains, selection based on increased hardness of grain in a warm irrigated region, does not materially increase the quality of the gluten, even though the percentage of gluten is actually increased.—*F. M. Schertz.*

513. Coblentz, Stanton A. **The decline of man.** *263 p.* Minton, Balch: New York, 1925.—This work discusses the present and future trend of the human race in popular language. The hypothesis that the human race as a species is already senile, decrepit and too highly specialized for its best interests is advanced. As species, genera and whole groups of animal life have disappeared, so may man unless he ceases his "life-long" (in a species sense) policy of drifting. Drifting has enabled an "absurd and artificial social selection" to replace

natural selection. Industrialism and urbanization both put less premium on mentality and encourage population increase from the bottom layers. The subjects discussed by chapters are: Why animals become extinct; Racial old age; The mental downfall of man; Over-specialization—national, military, industrial and urban; The whirlwind progress of science; The survival of the unfit; The patchwork growth of society; Extinct civilizations. Is there a doorway out?—*Orland E. White.*

514. Cohen Stuart, C. P. **Oogstvermeerdering en kostprijs.** [Crop increase and cost.] Thee **5**: 62–63. 1925.—The article contains data on the decrease in cost of production of tea which results from increasing the yield through varietial improvement.—*Carl Hartley.*

515. Comber, H. F. **Self sterility in Rhododendrons.** Gard. Chron. [London] Ser. III. **77**: 300–301. *1 fig.* 1925.—Experiments in cross and self-pollination at the Edinburgh Botanical Garden in 1923 are described.—*P. L. Ricker.*

516. Costantin, J. **A propos des mutations de la pomme de terre.** [Mutation in the potato (Solanum).] Ann. Sci. Nat. Bot. 10e Sér. **6**: xviii–xxxviii. *Fig. 1–9.* 1924.—This article contains a summary of the literature with bibliography.—*Paul Weatherwax.*

517. Crew, F. A. E. **The sex ratio and the question of the control.** Internat. Rev. Sci. and Pract. Agric. n. s. **2**: 554–570. 1924.—A considerable amount of literature on the subject is reviewed. Results obtained on "*Bonellia*, *Xiphophorous*, frog, *Triton*, pigeon, fowl and free-martin have shown the way in which an unusual sex-ratio may be the reflection of an abnormal differentiation of the sex organization of an individual leading to a complete sex-reversal. It is established that an individual with the chromosome constitution of one sex may come to possess the functional sex-equipment and capacity of the opposite."—*Oscar Riddle.*

518. Davenport, C. B. [Rev. of: Castle, W. E. **Genetics and eugenics.** *viii* + *434 p.* Harvard Univ. Press: Cambridge, 1924 (see Bot. Absts. 14, Entry 2556).] Science **61**: 541–542. 1925.

519. [Dekaprelevich, L.] Декапрелевич, Л., **К вопросч о раэмерах естественной гибридиэации у хлопчатника.** [Natural crossing of cotton in Transcaucasia.] Записки Наччно-прикладных Отелов Тифлиского Ботанического Сада. [Sci. Papers Appl. Sect. Tiflis Bot. Gard.] **3**: 90–98. 1924.—The writer finds that in case of mixed planting of cotton, the quantity of natural hybrids in the 2nd generation reaches 7%. By planting the 2 forms of cotton in alternate rows it was found that natural hybridization between the rows of planted varieties amounts to 1–5%. The insects which aid natural hybridization are mainly: *Anthrena dubitata* F., *Halictus albipes* F. var?, *H. sexcinctus* F., *Halictus* sp.? and *Apis melifica.* —*From author's summary.*

520. Dunn, L. C. **Two types of rumplessness in domestic fowls.** Jour. Heredity **16**: 152–160. *Fig. 1–13.* 1925.—Results of breeding experiments indicate that congenital absence of the tail, including rump, tail feathers, oil gland and caudal vetebrae, may be due to 2 distinct causes: (1) Inheritance, (2) an accident in embryogeny. Rumplessness of the hereditary type appears to depend on a single dominant gene, although this has not yet been found in homozygous condition; and crosses of heterozygous rumpless with normal recessives have produced more rumpless than normal (31 rumpless:20 normal). Rumplessness of the accidental type occurs sporadically in flocks of tailed fowls with a frequency of about 1 to 1000 based on observations of 10,000 chicks. Crosses of accidental rumpless fowls with normals have produced only normals. The 2 types are indistinguishable in appearance.—*Author.*

521. Durham, George B. **Has parthenogenesis been confused with hermaphroditism in Cucurbita?** Amer. Nat. **59**: 283–284. 1925.—Of 301 bagged flowers of *Cucurbita pepo*, none set fruit. Cutting and crushing the stigmatic tissues and placing foreign pollen upon them also failed to stimulate seed production. It is concluded that parthenogenesis does not occur in this species.—*D. F. Jones.*

522. [Égiz, S. A.] Эгиз, С. А. **Опыты по обоснованию методики селекции гречихи. [Experiments in buckwheat breeding.]** Труды по Трикладной Тотанике и Селекции. [Bull. Appl. Bot. and Plantbreed.] **14**: 235–251. 1925.—In this article are mentioned the results of 4 summers' experiments with buckwheat at the Acclimatisation Station in Detskoje Selo, near Leningrad, which may be summed up as follows: Homozygous short-pistilled

buckwheat has a flower which in its shape in no way dissembles that of a heterozygous short-pistilled plant. The pistil characters are conditioned by a single pair of allelomorphs *K* and *k*. In some cases illegitimate pollination of buckwheat leads to crop results identical with those obtained by legitimate pollination. With illegitimate pollination, an advantage of the short-pistilled flowers over the long-pistilled ones manifests itself. No definite symptoms of degeneration, caused by repeated illegitimate pollination are observed in the products of such pollination. Self-fertilization in buckwheat is not excluded. Races of buckwheat are met with which, when self-fertilized, show good results as regards full grain and normal descendants. The occurrence of individuals showing intermediate forms of flowers, may be of value in the selection of a self-pollinated and self-fertilized buckwheat race. The height character in buckwheat may be attributed to a pair of allelomorphs, *T* and *t*.—*E. Barulina.*

523. Ewing, H. E. **The factors of inheritance and parentage as affecting the ratio of alate to apterous individuals in aphids.** Amer. Nat. **59**: 311–324. 1925.—The work of the author and others is reviewed. The data indicate that factors affecting appearance or percentage of sexual forms are similar to those affecting ratio of winged and wingless in agamic individuals. The percentage of winged or wingless depends primarily upon ancestry. The optimum temperature for production of wingless forms is 65°F. and variation in either direction increases the number of winged. At optimum temperature other factors lose most of their effect. Limitation of food supply is important in production of winged forms, particularly at temperature far from optimum. The nature of the food, light, and evaporation are important. Either inheritance, temperature or nutrition may under certain conditions become the controlling factor. By "physiological inheritance" the author means a type of transmission not wholly dependent upon germ plasm (or at least the chromosomes). The character of the individual is dependent in part upon its general metabolism which is subject to environmental effects. This produces cumulative and hold-over effects from generation to generation. Finally, there results through excessive cumulative effects, an unbalanced metabolism which eventually rights itself by returning towards the mean of the race.—*Anna R. Whiting.*

524. Eyster, William H. **Mosaic pericarp in maize.** Genetics **10**: 179–196. *Fig. 1–6.* 1925.—Mosaic pericarp in maize is a coarse type of color variegation having the inconstancy typical of variegations. Several gradations of mosaic are recognized and are inherited. They form a series of multiple allelomorphs with the following order of dominance: self red, heavy mosaic, light mosaic, orange and colorless. With respect to variability, self red is constant; heavy mosaic gives rise to orange in 0.054 seed per M; light mosaic changes to red in 2 seed per M, to heavy mosaic in 0.25 seed per M and to orange in 0.62 seed per M; orange changes to self red in 0.11 to 6.7 seed per M and to light mosaic in from 32 to 93 seed per M. The color segregations in the pericarp of orange kernels produce what are commonly known as sectional chimeras, in that the orange color is replaced by equal and adjacent segments of red and white. This behavior furnishes good evidence that the mechanism of mitosis is involved. The fact that the change from orange to mosaic is reversible and that the mechanism of mitosis is involved would seem to indicate that the change is physical rather than chemical. The relation of orange and mosaic is such as to suggest that their genes are fundamentally alike in content but have different structural arrangements so that they may be said to be isomeres. If this view is adopted a change from orange to mosaic or the reverse can be conceived as the result of a rearrangement of the same gene elements.—*J. H. Kempton.*

525. Eyster, William H. **Zea mays gigas: A strain of native gigantic maize.** Jour. Heredity **16**: 185–190. *4 fig.* 1925.—A single gigas plant occurred in a 3rd inbred generation of a commercial variety of corn called Mastodon. The leaves of the gigas plant were more than 6 inches wide, and were thick and leathery in texture. The plant was self pollinated and the inbred strain resulting from it has the following characteristics: Broad leathery leaves, unusual vigor, high yield, and resistance to drought. The 6th generation plants were as vigorous and yielded as well as any commercial varieties grown under the same conditions.—*Author.*

526. Fischer, E. **Knospermutationen bei einer Schlangenfichte als vegetative Bastardaufspaltung. [Bud mutation in Picea excelsa virgata as a somatic segregation.]** (Abstract.) Mitteil. Naturf. Ges. Bern. **1924**: XXIV. 1925.

527. Fischer, E. **Weitere Beobachtungen über die im Botanischen Garten in Bern kultivierten Schlangenfichten. [Further observations on a cultivated tree of Picea excelsa virgata in the Bern Botanical Garden.]** Schweiz. Zeitschr. Forst. 1924: 301–304. *1 pl.* 1924.

528. Garrison, H. S., and Frederick D. Richey. **Effects of continuous selection for ear type in corn.** U. S. Dept. Agric. Dept. Bull. 1341. *1–10. Pl. 1-2.* 1925.—After 8 years of mass selection, 6 strains of corn differing in number of kernel rows on the ears and the indentation of the kernels were isolated from C. I. No. 119, a strain of Boone County. Beginning in 1915 with about 16.5, the mean number of kernel rows was shifted upward or downward by selection, so that the means of the 6 strains ranged from 22.9 to 10.9 in 1922. The productiveness of these strains and of crosses between them was compared with that of the parent variety. All of the selected strains yielded less than the parent variety. The strains which departed less tended to be more productive than those which departed more from the characteristic number of kernel rows of the parent variety. The crosses between selected strains ranged from about 15% less productive to about 5% more productive than C. I. No. 119. There was a direct relation between the productiveness of the individual crosses and the number of kernel rows by which their parent strains differed. This fact was interpreted as indicating that the selected strains were more or less homozygous for the different combinations of genetic factors determining the different numbers of kernel rows; consequently, close selection for a specific kind of ear would tend to produce results similar to that caused by inbreeding.—*H. S. Garrison.*

529. Gates, R. Ruggles. **Species and chromosomes.** Amer. Nat. 59: 193-200. 1925.—The author contends that studies of related species or genera indicate that the following types of changes have occurred in the phylogeny of the chromosomes: (1) Polyploidy, (2) transverse segmentation or fragmentation, (3) fusion end-to-end, (4) translocation of chromosome fragments, (5) non-disjunction, (6) hybridization. The author stresses particularly the importance of polyploidy in evolution, and he urges the desirability of including a statement concerning the morphology of the chromosomes in the description of species. He regards the occurrence of parallel mutation as revealed in experimental studies and the existence of longer parallel phylogenetic trends as shown by paleontological research as 2 important principles which have emerged from recent evolutionary studies. (See also Bot. Absts. 14, Entry 1924)—*R. E. Clausen.*

530. Günther, Hans F. K. **Rassenkunde des deutschen Volkes. [Knowledge of races of the German people.]** *6th ed. 514 p. 537 fig.* J. F. Lehmann: München, 1924.—The principle races of Europe are discussed. Historical data are presented of former and present great men as to the race or mixture of races to which they belong. Besides the Nordic and Mediterranean races, the Alpine race is divided into an Eastern and Dinaric. The Dinaric is especially noticeable for height and narrow face. Throughout the work many details are given as to the knowledge and development of races; the concept of race; the history of the study of races in relation to other fields of research; the nomenclature of 5 European races, in which are distinguished Nordic, Western, Dinaric, Eastern, and East-Baltic; and methods of measuring and observations in the study of races, in which various systems and instruments are described. The general characteristics of the body are described, in which also generalities of Asiatic and African races are mentioned. Growth, age and diseases of races in general are discussed, and a number of chapters are devoted to the psychical peculiarities of each of the 5 races. Pages 200–234 treat of race distribution over the area where German is spoken. A number of chapters describe such matters as influence of environment, genetics, race mixing, early races (Neandertal, Cromagnon, etc.), race and language in its various relations and change of races. The last part of the work (419–491) is entirely devoted to the Jewish people, the different types of Jews, and their influence mentally, politically and commercially. —*J. C. Th. Uphof.*

531. Gutierrez, M. E. **Progress report on five new hybrid varieties of tobacco.** Philippine Agric. Rev. 17: 253–260. *Pl. 1–6.* 1924.—Five crosses; Sumatra × Florida Sumatra, Florida Sumatra × Sumatra, Dammao Broadleaf × Sumatra, Connecticut Broadleaf × Sumatra, and Havana × Sumatra, showed in the 2nd generation certain improvements over the parental varieties in vigor, earliness, size of leaves and rapidity of growth and other

important characters. The cross of Florida Sumatra by Sumatra gave better results than the reciprocal combination.—*D. F. Jones.*

532. Hagedoorn, Arend L., and A. C. Hagedoorn. **The relative value of the processes causing evolution.** *294 p. 20 fig.* Martinus Nijhoff: The Hague, 1921.—This is a general work on evolution written from the genetic viewpoint. The authors point out that few biologists have interested themselves like Darwin, in genetical questions for the sake of their general aspect. The majority of biologists interested in genetics have been zoologists or botanists first and geneticists second. "There is one point in common to all theories of evolution, excepting Darwin's, and that is, that each theoretician has always over-emphasized one point , one single link in the chain of processes which goes to the making of species, and has brought out this point as 'the' cause of evolution," for example, Lamarck and adaptation, Weismann and selection, de Vries and mutation, Lotsy and crossing. The chapter on heredity discusses, among other things, the correct use of terms and symbols. "The use of the term 'unit-character' should, we think, be discontinued. We believe the facts all tend to make the view more and more untenable, that there is a distinction between germ-plasm and soma. . . . . Such things as Haeckel's Recapitulation theory, which states that ontogenetic development is a recapitulation of the phylogenetic development of the species, have now only historical interest." The chapter on variation discusses the kinds of variability from the standpoint of cause and how these bear on the problem of species origin. Other chapters are devoted to crossing, reduction of variability, mutation, selection, species and varieties, the law of Johannsen, evolution in nature and under domestication and the status of man. A bibliography is appended.—*Orland E. White.*

533. Harris, J. Arthur. **Variation and correlation in the inflorescence of Manfreda virginica.** Ann. Missouri Bot. Gard. **11**: 411–459. *Fig. 1–13.* 1924.—The data in this paper concerning various problems of fertility in *Manfreda virginica* are from countings of the floral parts made at various stations in the vicinity of St. Louis, Missouri, in 1906 and 1907. "About 22% of the flowers develop their ovaries into fruits. The correlation between number of flowers formed and number of fruit matured is of about medium value. This is, however, due to the fact that as the result of chance only the larger inflorescences should produce larger numbers of fruit. A special formula shows that there is little relationship between the size of the inflorescence as measured by the number of flowers which it produces and its capacity for maturing its ovaries into fruit. While the more proximal and more distal flowers show a smaller proportion of fruit production, there is little relationship between the size of the inflorescence and the position of the flowers which mature their fruit. Practically speaking, no correlation exists between the number of flowers on the inflorescence and the number of seed matured per locule. This is apparently in part due to the negative correlation between the number of fruit matured and number of seed per locule. If correlation for the number of fruit be made it is shown that the inflorescences which produce the larger number of flowers also mature slightly larger numbers of seed per locule. There is a slight negative correlation between the number of fruit ripened per inflorescence and the number of seed matured per locule. The fertility of the fruit tends to decrease slightly and approximately uniformly, from the proximal to the distal end of the inflorescence. While there is little relationship between number of flowers or number of fruit per inflorescence or position on the inflorescence and the number of seed per locule the correlation between the number of seed in the 3 locules of the fruit is high. Thus, there are as yet immeasurable factors which influence in a similar manner the seed production of the 3 locules of the same ovary. These may be in part ecological, depending upon accidents of fertilization, and in part physiological.—The result of greatest importance derived from the investigation is the generally low correlation between the meristic characters of the inflorescence and fruit and seed production. While variation in seed production is clearly the resultant of underlying causes, these "causes" are not easily located in the variations of the magnitudes of any of the antecedently formed structures. Thus, there is little relationship between the number of flowers formed per inflorescence and the number of seed matured per locule. This conclusion, that there is but a low correlation between somatic characters and fertility, is in full agreement with those drawn from a consideration of the relationship between the number of parts of the

involucral whorl and fertility in *Hibiscus*. This conclusion is not shaken by the more substantial correlations formed between number of pods and number of ovules and seed in *Phaseolus*, for here, as in *Sanguinaria* and in *Nothoscordum* and *Allium*, we have questions of possible age differentiation in the perennials or of the somatic character measured standing more directly in relation to the fertility characters as means of support, conducting tracts for plastic materials, or as an actual source of the elaboration of plastic materials."—*S. M. Zeller.*

534. Hauber, U. A. **An analysis by selection and crossing, of genetic factors involved in defective venation, a variable character of the parasitic wasp, Habrobracon juglandis.** Genetics 10: 91–116. 1925.—Selections for opposite extremes in an inbred stock through 19 generations in one direction and 22 in the other, produced no significant results. Less rigid selection for increased defectiveness in another stock, not previously inbred, had an immediate effect, the mean defect after 10 generations being increased nearly 3-fold. By crossing the 2 stocks and selecting, the various factors for defect were concentrated. By this method a new type was derived showing defect in practically all individuals and a mean grade of defect higher than any previously obtained. Locus of orange eye is linked with one or more of the minor factors for defect. There is a significant correlation between black eye color and sooty chest. The amount of defect is negatively correlated with sooty chest, suggesting linkage of some of the factors.—*Anna R. Whiting.*

535. Hayes, H. K., E. C. Stakman, and O. S. Aamodt. **Inheritance in wheat of resistance to black stem rust.** Phytopathology 15: 371–387. *Pl. 13.* 1924.—[For abstract, see this issue, Entry 875.]

536. Hays, Frank A. **Correlation studies on winter fecundity.** Massachusetts Agric. Exp. Sta. Bull. 220. *43–53.* 1924.—The following coefficients of correlation were calculated on the 1923 flock of Rhode Island Reds: (1) Between hatching date and weight at 150 days (for the entire flock), -0.3293 ± 0.0194; (2) between hatching date and weight at 1st egg, -0.3807 ± 0.0201; (3) between hatching date and age at 1st egg, -0.1487 ± 0.0228; (4) between hatching date and winter production (for the entire flock), -0.2920 ± 0.0218; (5) between hatching date and winter production (for the genetically early maturing birds alone), -0.4790 ± 0.0254; (6) between age at 1st egg and winter production (for the entire flock), -0.6061 ± 0.0151; (7) between age at 1st egg and winter production (1st 3 hatches only), -0.6413 ± 0.0320; (8) between weight at 150 days and winter production (for the entire flock), $+0.2758\pm0.0220$; (9) between weight at 150 days and winter production (for the hatches of April 15 and 22 only), $+0.2475\pm0.0545$; (10) between weight at 1st egg and winter production (for the entire flock), -0.1894 ± 0.0231; (11) between weight at 1st egg and winter production (for the 1st 8 hatches only), -0.2963 ± 0.0269; (12) between average daily gain, 150 days old to age at 1st egg, and winter production (for entire flock), $+0.2899\pm0.0220$; (13) between average daily gain, 150 days old to age at 1st egg, and winter production (for the genetically early maturing group alone), $+0.2055\pm0.0318$; (14) between weight at 150 days and age at 1st egg, -0.2135 ± 0.0221; (15) between weight at 1st egg and age at 1st egg, $+0.4604\pm0.0185$; (16) between average daily gain and number of days from 150 days old to age at 1st egg, -0.4145 ± 0.0196; (17) between winter and annual production, for 3 previous flocks, -0.6214 ± 0.0142.—The most important single characteristic upon which to select pullets for winter production is age at 1st egg. Weight at 150 days and hatching date are of equal importance in such a selection, but of much less significance than age at 1st egg.—*Author.*

537. Heinricher, E. **Notiz über die F_2-Generation des von mir gezüchteten Bastardes Lilium sp. ♀ × L. croceum Chaix ♂ und über das Interesse, auch den reziproken Bastard zu Ziehen und sein Verhalten kennen zu Lernen.** [**A note onthe F_2 generation of the hybrid Lilium sp. ♀ × L. croceum Chaix ♂, and on the reciprocal hybrid and its behavior.**] Zeitschr. Indukt. Abstamm.- u. Vererb. 37: 83–85. 1925.—The article contains a brief review of the author's previous papers on the F_1 of this hybrid, and on *L. croceum* and *L. bulbiferum*. The F_2 of hybrid *L. sp.* ♀ (resembling *L. tigrinum*, but never having bulbils) × *L. croceum* ♂ (bulbil bearing) shows some pure plants of each of the parent species; hence its heredity is called Mendelian, although the numbers appear too small for the required one-fourth. The F_1 is bulbil-less like the ovule parent. Raising the reciprocal hybrid would be desirable because egg-plasm might possibly cause its F_1 to bear bulbils and its F_2 to be correspondingly different from the one already raised.—*Hester M. Rusk.*

538. Holmes, S. J., and I. Wilson. **Age of parents and order of birth in relation to longevity of offspring.** Jour. Heredity **16**: 47–50. 1925.—The data on which this investigation was based were obtained from Allstrom's Dictionary of Royal Lineage. A study was made of all families given in this work which had 4 members who lived to be 21 or more years of age. The ages at death of the offspring were tabulated in relation to the age of both of the parents at the time the offspring were born. It was found, in general, that the age of parents had little if anything to do with the longevity of their offspring. A study was made also of the longevity of offspring in relation to order of birth. It was found that order of birth had no appreciable influence on duration of life. These results are equally at variance with those of Casper Redfield, on the one hand, and Karl Pearson on the other.—*Authors.*

539. Honecker, L. **Chlorophylldefekte bei Gerste. [A chlorophyll defect in barley.]** Zeitschr. Pflanzenzücht. **10**: 172–173. 1925.—A certain barley, Wadsacks So., derived from Svalöf's Gold, possesses a single (lethal) factor for defective chlorophyll which becomes active only when crossed with certain varieties, such as Kunow's Moravia, and then only in certain families resulting from the cross. Seedlings having the defect were a lighter green at emergence, rapidly took on more yellow, and at 2 weeks from emergence began to die.—*L. R. Waldron.*

540. Houtzagers, G. **Veroudering bij vegetatieve voortplanting. [Senility in vegetative reproduction.]** Landbouwk. Tijdschr. **37**: 161–178. 1925.—Senility in species which are propagated vegetatively can not be demonstrated scientifically. Cytologically and morphologically it is shown that senility is out of the question. Vegetative reproduction prevents the production of biological races.—*J. C. Th. Uphof.*

541. Howard, A., and G. L. C. Howard. **Natural cross-pollination in Indian linseed.** Agric. Jour. India. **19**: 222. 1924.

542. Hurst, Charles Chamberlain. **Experiments in genetics.** *xxiv + 578 p. 175 fig.* Cambridge Univ. Press: Cambridge, 1925.—In this volume the genetic papers of the author, 38 in number, published between 1897–1925, are brought together, arranged chronologically, indexed in great detail and a corrigenda page is added. Detailed tables of contents, illustrations and figures precede the papers. The subject matter deals with orchid breeding; experiments in hybridisation and cross-breeding in relation to the various taxonomic groups (varieties, species, genera, etc.); limits of crossing; hybrid vigor; fertility of hybrids in various orchid genera; notes on Mendel's methods of cross-breeding; Mendel's principles applied to orchid and wheat hybrids; false, dominant and intermediate hybrids in orchids; Mendel's discoveries in heredity; experiments on heredity in peas, rabbits, poultry; inheritance of coat color in horses; Mendel's laws; Mendelian characters in plants and animals; Mendel's law of heredity and its application to poultry breeding; inheritance of eye color in man; heredity experiments in sweet peas demonstrated; Mendel's law and its application to man, as regards eye, hair color, musical sense and diseases; inheritance of albinism in orchids; Mendel's law of heredity and its application to horticulture; Mendelism and sex; Mendelian characters in plants, animals and man; application of genetics to horse-breeding; application of genetics to some practical problems in numerous organisms, listed among those experimented with, are snap-dragons, fruit and forest trees, hollies, pigeons turnips and cabbages, rhododendrons and azaleas and Berberis; Mendelian heredity in man summarized; "rogues" in sweet peas; genetics of egg-production in poultry, particularly in White Leghorns and White Wyandottes; genetics of fecundity in the domestic hen; origin of the moss-rose; chromosomes and characters in *Rosa* and their significance in the origin of species. The last 2 subjects mentioned represent material reported before scientific bodies, but not found elsewhere in published form. Under the 1st, the history of the moss rose (*Rosa muscosa* Mill.) and its near ancestors is discussed in detail. Darwin's conclusion that it is a bud mutation of *R. centifolia* L. is confirmed by series of studies on bud-variations in *R. centifolia* and in the moss-rose itself. In *R. centifolia*, 63 bud variations have been followed through several bud generations. The bud variations in the 2 forms are precisely parallel, the sole difference between them being the "moss" character. Moss rose varieties have all been derived apparently either from direct bud mutations of *R. centifolia* or from other moss-roses, no other species of rose being known to produce such mutations. Both the parent

species and the moss forms have long been regarded as sterile, though the author through selfing under certain conditions, did secure apparently good fruits, one of which contained a single normal seed. In both forms, most of the pollen was abnormal. Pollination of other forms of *Rosa* with pollen from these forms has given fruit, but these may not contain hybrid seed, owing to apomixis. A single flowered mutant of the original "moss" proved fertile, and through crosses gave rise to numerous varieties. Numerous reversions of the "Old Moss" to *R. centifolia* have taken place. The evidence indicates that the "Old Moss" was a heterozygous dominant. The last paper gives a very detailed discussion of the chromosome and character relations in *Rosa* and the significance of these in the origin of species. The cytological results of Täckholm, Blackburn and Harrison, Strasburger, as well as much new data, are given in detail. The author's data confirm the work of the 1st mentioned authors as to the fundamental *n* chromosome number of *Rosa*, being 7, not 8 as stated by Strasburger. Further investigations show that all forms examined as to somatic or gametic chromosomes are either 7 or a multiple of 7. Somatic chromosomes are 14, 21, 28, 35, 42, 56. Gametic chromosomes are *equal*, with 7, 14, 21, or 28 each, or unequal and matroclinous with a maternal bias in the ratio of 1.5–2–3–4 or 5:1. All are 7 or multiples. All somatic and gametic chromosomes of Rosa so far appear to be equal in size and alike in form in all species, the nuclei becoming larger as the type chromosome number increases. The chromosomes work in septets or sets of 7. Two kinds of species are recognized—diploid and polyploid. There are 5 differential diploid species, each representing a real discontinuous species with no transitional forms, differing from one another in at least 50 taxonomic characters and each having a double septet of 14 2n chromosomes. The polyploid species, so far as known, are triploid (21), tetraploid (28), pentaploid (35), hexaploid (42), or octoploid (56) as to chromosome septet number. In certain cases, a tetraploid form may represent only duplication of a diploid, but in most cases, the polyploid species examined are not the result of chromosome septet duplication, since their taxonomic characters represent various combinations of differential septet characters of the 5 differential diploid species. The 5 diploid species are lettered AA (*R. indica* L., *R. Brunonii* Lindl., *R. multiflora* Thumb., *R. moschata*, Mill.); BB (*R. Willmottiae* Hemsl., (*R. sericea* Lindl., *R. Hugonis* Hemsl.); CC (*R. rugosa* Thumb.); DD (*R. fraxinifolia* Lindl., *R. pisocarpa* A. Gray); EE (*R. macrophylla* Lindl.). A tetraploid form resulting from mere duplication of a septet AA would be AAAA and very similar in taxonomic character except perhaps larger, while a tetraploid form resulting from a combination of 2 differential diploids would be AABB, AACC, etc., and have characters of both species. Various differential polyploid species are listed with their lettered designations, for example, the tetraploid species, *R. centifolia* L. (AACC) and the octoploid species *R. acicularis* Lindl. (BBCCDDEE). The evidence indicates that each septet works equally with but independently of the other septets. So far, no cases of blending or general dominance of one septet over another have been observed. The value of the septet method in classifying species is pointed out. The ecological and geographical distribution of the diploid and polyploid species is described and discussed, particularly from the standpoint of moisture and temperature. A section is devoted to a discussion of evolution from the standpoint of the conditions found in *Rosa*. The suggestion is made that a northern decaploid species possibly gave rise to the species with smaller chromosome numbers. A monograph of the genus *Rosa* in several volumes has been planned, the 1st volume of which will be devoted to the 5 diploid species.—*Orland E. White.*

543. Jeffrey, Edward C. **Polyploidy and the origin of species.** Amer. Nat. 59: 209–217. 1925.—Attention is called to the existing polyploid condition of chromosome number in the species within several genera. Two kinds of polyploidy are recognized: (a) When the somatic number is double the gametic number of chromosomes, diploid and tetraploid; (b) when the somatic number is an uneven multiple of the gametic number of chromosomes, triploid and pentaploid. The term "artioploid" is suggested for the 1st and perissoploid for the 2nd condition. "The study of large genera along both comparative and experimental lines is more likely to throw real light on the origin of species than the intensive genetic investigation of mutating species, such as those of *Oenothera*, *Drosophila*, or *Datura*." Morphology rather than genetics is destined to supply the pertinent information regarding the origin of

new species. Species differentiation in the genus *Rubus* has come about largely as a result of hybridization. A list of 18 species having a hybrid origin is given. The different forms found in *Drosophila* and *Datura* are considered as evidence of chromosome irregularities as a consequence of previous species crossing.—*J. L. Collins.*

544. Kelaney, Mohammed A. **Inheritance in Nicotiana Tabacum. VI. A Mendelian analysis of certain flower form, flower and filament color, and leaf base characters.** Univ. California Publ. Bot. **11**[2]: 31–59. *6 fig.* 1925.—Normal, calycine, Klebs-normal, lacerate, and apetalous flower forms were found to exhibit the following Mendelian differences: *C C Ap Ap* = normal, *c c Ap Ap* = calycine, c^a c^a *Ap Ap* = Klebs-normal, c^a c^a *Ap ap* = lacerate, c^a c^a *ap ap* = apetalous. Two pairs of factors account for the relation existing between red, light pink, and white flower colors. A 3rd pair of factors is necessary to account for carmine. The epistatic complementary factor *G* with the flower color factor *P* produces pink filament color. If one or both are represented by the recessive allelomorph, a light green filament is produced. Lanceolate, petioled, broad, short-petioled F_1, and constricted leaf-base types were found to exhibit the following Mendelian differences: *SSAA* = lanceolate, *SSaa* = petioled, *ssAA* = broad, *SsAa* = short-petioled F_1, *ssaa* = constricted. The factor pair *Ap-ap* exhibited trisomic inheritance ratios in association with the trisomic character, "enlarged." Linkage with 7.5 % of crossing-over was found between the factors, *A-a* for leaf-base type and *P-p* for flower color.—*W. A. Setchell.*

545. Kirkpatrick, Charles D. **Experience in developing a high-yielding strain of corn.** Jour. Amer. Soc. Agron. **17**: 487–488. 1925.—Usually samples of corn have been judged on the assumption that the crop would be improved if the seed ears conformed to a certain type. These characters have a usefulness in elementary corn study but are not trustworthy in careful breeding operations.—*F. M. Schertz.*

546. [Kozlov, V.] Козлов, В. **Морфологическое изучение Важнейших сортов капусты Московского района. [Morphological study of the most important varieties of cabbage in the district of Moscow.]** Из работ Грибовской Селекционной Станции. (Proc. Gribovsky Plant-Breed. Sta.) No. 1–19. Moscow, 1925.—The paper acquaints the reader with: (1) The history of the 3 most important varieties of the district; (2) the coefficients of variability of the different characters; (3) the coefficients of correlation for 6 pairs of characters, the most important ones from the point of view of selection.—*E. Sinskaja.*

547. [Kozo-Polîanskii, B.] Козо-Полянский, Б. **Симбиогенезис в эволюции растительного мира. [Symbiogenesis in the evolution of the plant world.]** Вестн. Опытн. Дела [Jour. Exper. Work] 4. *1–24.* 1921.—The principal, perhaps even the only way of variation from the point of view of the author is the formative symbiosis. The possibility of hereditary differences arises as a result of a synthesis of elementary vital units into more complex ones, of synthetic associations into associations of higher degrees taking place in the whole world and of an interaction of the components. The hereditary character of the consortions is secured by the presence of formative germs in the organs of reproduction of their components. The only elementary organism, which apparently does not represent a consortion, that may be considered, is the microbe.—In his paper the author briefly sets forth his theory with references to a series of works of Russian and other scientists on the question of symbiosis among animals and plants.—*E. Sinskaja.*

548. Laughlin, H. H. **Eugenics in America.** Eugenics Rev. **1925**: (1–18). April, 1925. —The article gives a brief review of the history of the Eugenics Record Office at Cold Spring Harbor, Long Island, New York, and the work which is being carried on there. It also states some of the eugenic problems facing America at the present time, with comments on their significance.—*Dorothy I. Neff.*

549. Leighty, C. E., and W. J. Sando. **A handy pollen carrier.** Jour. Heredity **16**: 63–65. *2 fig.* 1925.—A device is described, consisting of a nickel-plated brass ring, opened at one point so that it may be adjusted to the index finger, attached to the periphery of which is (1) a hollow cylinder for holding a gelatin capsule which serves as a pollen receptacle, and (2) a solid projection over which the cap of the capsule may be slipped. This device permits free use of the fingers in pollination and the capsule prevents contamination and other injury to the pollen.—*Authors.*

550. Leupold, E. **The significance of cholesterin-phosphatide metabolism for sex determination.** *112 p. 1 pl., 45 fig.* Gustav Fischer: Jena, 1924.—It is urged that sex determination is effected by the relative concentration of cholesterin and lecithin in the blood and the consequences of this concentration on the egg cell. The nature of this action is complex and many-sided; the simultaneous mass relations of these 2 substances in the blood are more important than their absolute value. Increased concentration in blood serum leads to the differentiation of the ova (rabbits) into females; decreased concentration, into males. Nutrition and its fluctuations are therefore important factors. The last 14 days preceding ovulation includes the period of chief importance to this differentation, though all ova forming a litter are not thought to ripen simultaneously. Staining reactions of the ova indicate these are of 2 kinds. The sexually differentiated ♀ nucleolus shows the presence of stored phosphatide; in the ♂ nucleolus this is lacking. About 147 ♂ and 114 ♀ rabbits were reared, following experimental feedings combined with occasional blood serum examination of the prospective mothers.—*Oscar Riddle.*

551. Levine, C. O. **Albino water buffaloes.** Jour. Heredity **16**: 66. 1925.—Albino water buffalo calves are not common in China except in the Island of Hainan and in Tonking, Indo-China. It is estimated that on this island, ⅓ of the buffaloes are albino. They are held in especial favor because of their supposed immunity to disease, particularly to rinderpest.—*R. Cook.*

552. [Levitskii, G. A.] Левитский, Г. А. **Материальные основы наследственности. [Material foundations of heredity.]** *165 p.* Государственное Издательство Украины. [State Publ. of the Ukraine] Kief, 1924.—This work is an exhaustive compilation of investigations concerning the material foundations of heredity. The material is arranged as an independent discipline, which is termed by the author "pylogenetics" and which is made up of the synthesis of experimental genetics, cytology, embryology and the mechanics of development.—The 1st chapter is devoted to the relations of the hereditary factors with the nucleus, these being treated historically. Much attention is given to the works of the school of S. G. Navaschin. A chapter follows on the localization of the factors, as developed by T. H. Morgan and his co-workers. In the chapter on the importance of the cytoplasm in heredity, data are given on the part played in the process by chondriosomes, and the correlation between the paternal and maternal cytoplasm is shown. An extensive chapter is devoted to the theory of heredity and the nature of the genes; the history of the problem is given, as well as the earlier conceptions of the elementary hereditary units (Spencer, Darwin, de Vries, Weismann), the modification of these ideas under the influence of Mendelism, and finally their transition to a concrete idea of genes. The fermentative theory of genes and the corpuscular organological theory are mentioned. The concluding chapter discusses caryological evolution. —*Dorochenko.*

553. Lillo, M. **Un cambio curioso de sexualidad.** [A curious change of sexuality.] Darwiniana 1^{3-4}: 163–164. 1924.—A plant of *Pisonia ambigua* Heimerl, one of the Nyctaginaceae which for 35 years produced only ♂ flowers, suddenly changed over to pistillate flowers.—*C. M. Hicken* (*transl. by Orland E. White.*)

554. Löbner, Max. **Züchterisches bei Primula chinensis.** [Breeding Primula chinensis.] Gartenwelt **28**: 44–45. 1924.—When a long-styled Primula is self-pollinated or is fertilized by another individual with long styles, the offspring has long styles. Contrary to results obtained with *P. obconica, P. chinensis* produces seed under these conditions. Long styled × short styled produces short and long styled offspring in equal numbers. From a cross between Amaranthe and Nordstern, a beautiful set of different colors was obtained.—*J. C. Th. Uphof.*

555. [Meister, G. K., and N. G. Meister.] Мейстер, Г. К., и Н. Г. Мейстер. **Ржанопшеничные гибриды. [Rye-wheat hybrids.]** *216 p.* Moscow, 1924.—This work treats of the mass appearance of inter-genus hybrids of wheat and rye. The 1st chapter is a general historical survey of rye-wheat hybrids, citing the principal literature. The following chapters are devoted to a detailed morphological and genetic analysis of F_1 and F_2, with data as to their fertility and a classification according to phenotypes. The various forms and types are characterized in detail. The analysis of the segregation and of the inheritance of charac-

ters in F_2, F_3, F_4 have led the authors to the conclusion that an important part in the process of form origination is played by the wheat chromosomes, which numerically prevail. The authors point out the tendency for an individualization of the parental types and observes the sorting out of the chromosomes of one or the other parental type. The general process of the individualization of the types leads to the conclusion that a return to the initial parental forms takes place. The work contains a short preliminary section on the cytology of rye-wheat hybrids by Zalensky representing a cytological analysis of 3 generations.—*Dorochenko.*

556. Nagai, Isaburo. **Observations on the somatic segregation in soy beans.** Japanese Jour. Bot. 2^1: 63–69. 1924.—Progenies of the hybrids of soy beans often show a marked fluctuation in color characters of the seed coat even in those seed which are produced by a single individual. Case 1 describes the progeny of an F_3 individual from a cross between a yellow bean and a brown bean mottled with black. The progeny of this plant bore both brown spotted yellow (6) and solid yellow seed (69). The author explains the appearance of both kinds on the same plant as a "somatic" factor mutation in a homozygous plant. Case 2 is described as similar and explained as a possible factor mutation in a plant heterozygous for yellow seed coat. Case 3 describes the progeny of an original cross between a black and a yellow variety. The brown seed on an F_3 chimera plant, bearing both black and brown seed, bred true. Case 4 is given as an example of seed-coat-color somatic segregation, which may be due to chromosome elimination. A 5th case is described in which a cross between a green and a black variety produced seed in the F_3 generation with a marked range in degree of black mottling. The very dark seed bred true. The lighter ones produced seed which varied in degree of mottling but differed from the previous generation as to the mean class, when the seed were classified according to their degrees of mottling. In conclusion, factor mutations are discussed and the author suggests that there may be a relation between the quantitative differences of phenotypic expressions and the respective difference in quantity of the material which composes the gene. He states that since the physical nature of genes is quite unknown, it may be safe to explain a mutation as a permanent rearrangement in the distribution of the material composing the gene.—*Mary Ellen Peck.*

557. [Nikolaeva, A. G.] Николаева, А. Г. **Материалы по цитологии ржано-пшеничных гибридов.** [**The cytology of rye-wheat hybrids.**] Научно-Агрономический Журнал. [Sci. Agron. Jour.]. 1^{9-10}: 570–576. *Fig. 1–7.* 1924.—The author has analysed F_2 rye-wheat hybrids. The diploid number of chromosomes of these hybrids was very similar and equalled 44–72. The number of conjugants, which often exceeds 7, bears no direct relation to the degree of fertility of the given plant. The number of conjugants exceeding 7 pairs leads us to suppose that this increase takes place at the expense of the wheat chromosomes. The irregular distribution of the chromosomes in the 1st division is characteristic of F_1. This irregular distribution of the chromosomes on the spindle of the 1st division, observed in hybrids, is pointed out by the author as also occurring in a series of other plants ("pure species"), though less marked, which suggests some remote hybridization in the past.—*Dorochenko.*

558. Nohara, Sigeroku. **Experimental studies of pollen of some Salix.** Japanese Jour. Bot. 2^1: 1–33. *Pl. 1–2, fig. 1–8.* 1924.—By a series of experiments, the longevity and conditions favorable to the growth of Salix pollen grains were determined. Pollen can retain its germinating ability for 70 days and its fertilizing power a corresponding length of time. Moisture is most detrimental to its life—heat more so than cold and light more than dark. Chloroform and ether both have an effect upon the viability of pollen, the former more than the latter. Cane sugar solutions may be used as culture medium. Forcing does not destroy the viability of pollen. Interspecific crosses may be made between some species and the F_2 procured, though the reciprocal cross is not always successful. Pollen from hybrids varies in shape and size, but the seed are not inferior to those of normal trees. Hybridization has changed a dioecious form to a monoecious form.—*Mary Ellen Peck.*

559. Ostenfeld, C. H. **Some remarks on species and chromosomes.** Amer. Nat. **59**: 217–218. 1925.—The author contends that cytological determinations are descriptive features which have not greatly advanced our knowledge as to the origin of new species. He argues that we wish to know the causes operating in the production of new forms, and how to

control them. They may be changes in chromosome numbers or in other characters which are not associated with visible chromosomal changes.—*R. E. Clausen.*

560. Peacock, A. D. **Animal parthenogenesis in relation to chromosomes and species.** Amer. Nat. **59**: 219–224. 1925.—The author discusses the nature of parthenogenesis in certain F_1 species hybrids. One F_1 ♀ from *Tephrosia bistortata* × *T. crepuscularia* produced parthenogenetically 1 ♀ and 2 ♂ offspring, which varied among themselves and were not comparable to normal F_2 offspring. The author contends that these results secured by J. W. H. Harrison show that new forms may emerge as a consequence of hybridity and correlated parthenogenesis. He also argues that Arton's investigations with *Artemia salina* show that parthenogenesis has been closely correlated with the emergence of the tetraploid race and is here responsible for its maintenance. In a brief appendix attention is drawn to further results secured from the above discussed lepidopteran cross. A melanic *T. bistortata* ♀ crossed with a normal white *T. crepuscularia* ♂ gave white F_1 hybrids, one of which gave 2 melanic offspring, a ♂ and a ♀ by parthenogenesis, corroborating the former result.—*R. E. Clausen.*

561. Pellew, Caroline. **A note on the inheritance of egg-colour in the silkworm.** Jour. Genetics **15**: 233–235. 1925.—The author reviews Toyama's and Uda's statements concerning inheritance of egg-color and concludes that Mendelian and maternal influences are both operative. The 3 egg colors, blue, brown, and crimson, are all recessive to slate. In relation to slate, blue is determined by the mother, crimson by the factorial constitution of the embryo, and brown by the mother, when she is homozygous, but mainly by the factorial constitution of the embryo, when she is heterozygous. Further genetic knowledge concerning these colors is lacking.—*J. L. Collins.*

562. Preston, Isabelle. **Liliums from seed in Ontario.** Gard. Chron. [London] III. **76**: 320–321. *Fig. 116–118.* 1924.—Notes on the crossing of species and the results obtained are given.—*P. L. Ricker.*

563. Reed, George M. **The inheritance of resistance of oat hybrids to loose smut.** Mycologia **17**: 163–181. 1925.

564. Richardson, A. D. **Stock and scion.** Gard. Chron. [London] Ser. III. **77**: 166–167. 1925.—A green leaved scion from *Aucuba japonica* grafted onto a variegated plant became variegated. This is said to be the 1st record of such an occurrence in this species. Similar phenomena in apple, pear, quince, jasmin, laburnum, and citrus are cited.—*P. L. Ricker.*

565. Riddle, Oscar. **Complete sex-transformation in adult animals.** The New Republic **41**: 225–228. 1925.—Three cases in the previous literature are considered adequately demonstrated instances of complete sex reversal in adult animals. These cases, Triton (Champy), fowl (Crew) and pigeon (Riddle), are discussed and their bearing on the metabolic theory of sex is considered. The principle of complete reversibility is applied to other characters than sex.—*Author.*

566. Riddle, Oscar. **Some concurrent changes involving the newer aspect of the sex problem.** (Abstract.) Science **61**: 521–522. 1925.—The article is a summary statement on 4 kinds of seasonal changes obtained from pigeons. The entire year is divided into seasons on the basis of periods of larger and smaller thyroid size in adults. Three kinds of sex data earlier obtained are given a classification under season as thus defined. Under the breeding methods used the sex ratio is different in seasons of high and low thyroid size; the proportion of males being greater in the periods of largest thyroid size (winter). The storage metabolism of the ova is lowest at this same period, and greatest at the period of smallest thyroid size (summer). The percentage of alcohol-soluble material stored in the ova is probably significantly less in the season of largest thyroid size. Deviations from close concurrence chiefly concern the autumn period; a probable explanation is suggested. It is not thought that seasonal thyroid changes effect changes in the sex ratio under usual or normal conditions of breeding.—*Author.*

567. Rosenberg, Otto. **Chromosomes and species.** Amer. Nat. **59**: 205–208. 1925. —The article is a general discussion of the possible methods of origin of balanced chromosomal conditions. The author suggests that the addition of chromosomes to a balanced set

by hybridization may give rise to a new balanced type, although this does not occur universally, as is shown by the behavior of the Drosera hybrid. Miss Ljungdahl's *Papaver* crosses are cited as illustrations of origin of new balanced conditions from hybridization. The author discusses diverse behavior of non-conjugating chromosomes in non-disjunction, which may possibly lead to production of balanced conditions with fewer or more pairs of chromosomes than the parents. The question of phylogenetic significance of chromosome number is touched upon. In groups, higher numbers probably represent recently evolved species; but if transverse fission has sometimes been a method of increase in chromosome number, then the possibility of decrease by fusion cannot be neglected.—*R. E. Clausen.*

568. Rudno, G. V. **Beobachtungen über vegetative und geschlechtliche aufspaltung bei kartoffeln.** [**Observations on vegetative and sexual segregation in potatoes.**] Zeitschr. Pflanzenzücht. **10**: 291–294. 1925.—In 1921 some white flowered plants were observed in a field of Parnassia potatoes which from the color of their flowers and some other characters appeared to be distinct from the variety Parnassia. Fifty of these variants were isolated in 1922 and 150 specimens were grown in 1923. Among these were 2 which each bore a branch with the typical lilac flowers of Parnassia and with a double corolla. Tubers from these 2 specimens were grown in 1924, and the 6 offspring from 1 lot produced white flowers, while of the 10 offspring from the other, 8 bore white and 2 bore lilac colored flowers. Seedlings from Parnassia and from the mutant were grown in 1923 and a great similarity between them was noted. The mutant was successfully crossed with the variety Hindenburg and the resultant seedling progeny studied with respect to tuber shape and color of flower. Round tubers and white flowers seemed to be dominant characters.—*W. Stuart.*

569. Salaman, R. N. **Genetic studies in potatoes: McKelvie's Arran Victory mutations.** Jour. Genetics **15**: 267–300. *Pl. 6–7, fig. 1–6.* 1925.—This paper is based on a critical study of 3 mutations from Arran Victory (a rather recent seedling introduction by McKelvie) by the author, covering the 3 crop seasons, 1922–1924, inclusive. These mutations were 1st observed and reported by McKelvie at the International Potato Conference in 1921. The chief point of interest in McKelvie's paper was his claim that in his mutation No. 3, aside from loss of tuber color, certain changes in plant character had also occurred. This statement, together with an offer to supply material for study, led Salaman to undertake the work here reported. Mutation No. 1 differed from Arran Victory in that half the tuber was colored like its parent while the other half was white. In mutation No. 2 the difference was in a material dilution in color, instead of having a deep blackish purple skin as in Arran Victory it had a dilute reddish purple skin with deeper purple at stem end and with purple eyes. The original tuber of mutation No. 3 was more or less parti-colored, the stem-end being splashed with purple and the remainder white except the eyes, all of which were pigmented; later on, all white tubers were found, the plants from which showed certain stem and leaf differences from Arran Victory. As all 3 mutations produced sterile pollen the author in 1923 crossed Arran Victory and its mutations with pollen from an inbred seedling designated as "X" in order to permit of a genetic analysis of the resultant seedlings. The data obtained from this study give the percentage of black, red and white skinned tubers. Stem color and tuber shape were also noted, as well as vigor and height of seedlings and their resistance or susceptibility to virus and fungous diseases. The author came to the following conclusions: "McKelvie's mutations of Arran Victory are characterized by increasingly greater losses of pigment in the tuber. Up to a certain stage the other parts of the mutant plants do not vary from the type. When the loss of pigment from the tuber is practically complete, a change takes place both in the stem and in the shape of the tuber. Notwithstanding the loss of pigment there still remain sufficient resemblances to confirm the relationship of this extreme mutant form with the type plant. There is no reason whatever to doubt but that McKelvie's mutant No. 3 is derived from Arran Victory." Reduction in tuber pigment is correlated with reduction in number of ovules capable of giving rise to colored tubers, with color in stems, and with an excess of long tubered seedlings. A somatic mutation characterized by loss of a specific character such as pigmentation of tuber skin, may evince this loss in other directions.—*W. Stuart.*

570. Schaffner, J. H. **What happened to the pandanus bud sport?** Jour. Heredity **16**:

62. 1925.—In 1919 the writer reported a bud mutation in *Pandanus utilis*, from a 2-ranked arrangement of leaves to a 3-ranked arrangement. After 5 years this plant has reverted to the previous condition.—*R. Cook.*

571. Schultz, E. S. **Why potatoes run out.** U. S. Dept. Agric. Farm Bull. 1436. *1–20. Illus.* 1924.—Mosaic, leaf-roll, spindle-tuber and related diseases are mainly responsible for so-called degeneration or running out of potatoes. These diseases, carried by sucking insects from field to field during the growing season can be combatted effectively only by field inspection and frequent roguing of affected plants. The diseases are also carried over from year to year by apparently healthy tubers so that selection of seed by appearance has no appreciable effect in obtaining a disease-free planting.—*Mary Ellen Peck.*

572. Shamel, A. D., C. S. Pomeroy and R. E. Caryl. **Bud selection in the Washington Navel orange.** Jour. Heredity **16**: 232–241. *6 fig.* 1925.—This is 3rd in a series of papers detailing the results of progeny tests of a number of bud variations of citrus fruits. The present paper describes the occurrence of 3 different limb variations in a tree of the Thomson strain of the Washington Navel orange which was found in 1910 in a commercial orchard. Propagations were made in 1915 from the limb variations and from the normal part of the parent tree. The resulting trees began bearing in the 1920–1921 season and the crops produced during 5 seasons show that the characteristics of the strains that were propagated were in each case transmitted to the progeny trees. These tests emphasize the fundamental importance of careful bud selection in the commercial propagation of citrus trees in order that the production of the individual trees in orchard plantings may be improved and made more uniformly like that of the best trees of the variety.—*C. S. Pomeroy.*

573. Shull, A. Franklin. **The life cycle of Macrosiphum solanifolii with special reference to the genetics of color.** Amer. Nat. 59: 289–310. 1925.—Two varieties of *Macrosiphum solanifolii*, pink and green, owe their color to globules of different colors and sizes contained in body fluid; 4 forms belonging to each variety, are described. Parthenogenetic females breed true for color. Sexual females produce but few fertile eggs. Green females by green males of the same line produced all green but 2. Green females by green males of a different line produced mostly green individuals although several were pink. Pink females by pink males of same line produced but 2 offspring, both pink. Pink females by pink males of a different line produced both pink and green offspring. Green females by pink males gave only green, although it is thought that pink may occasionally be produced by such parents. Results indicate that color is due to multiple factors. Pink lines produced fewer young per day. This seems to be associated with color and not inherited independently. Since the pink variety does not produce sexual females except in late autumns, it probably descends from the green variety each year. Any form may live and reproduce on either host (rose, potato) at any time of year.—*Anna R. Whiting.*

574. Sinnott, Edward W., and L. C. Dunn. **Principles of genetics.** An elementary text with problems. *XVIII + 431 p. 141 fig.* McGraw-Hill: New York, 1925.—The emphasis in this text has been placed on the principles rather than the practical applications of genetics, although the illustrative and problem material has been drawn from plants and animals of economic importance where possible. Each chapter is followed by a series of questions for thought and discussion and sets of problems and reference assignments. The subject matter is classified by chapters under the science of genetics in general, heredity and variation, Mendel's laws of inheritance, the expression and interaction of factors, the physical basis of inheritance, linkage, the chromosome theory of inheritance, sex and its inheritance, the inheritance of quantitative characters, the types and causes of variation, the application of genetics in plants and animal breeding, inheritance in man, and the problems of eugenics. A bibliography of general reference works is appended.—*Orland E. White.*

575. Smith, A. B. D. **Shorthorn colors.** Jour. Heredity **16**: 73–84. *3 fig.* 1925.—Various hypotheses concerning the inheritance of the roan color in Shorthorn Cattle are discussed. After tabulating herdbook data the writer finds a deviation from the monohybrid theory (namely, that roan is the heterozygote of red and white) of 5.8% which he considers negligible. He finds all reports that roan can breed true to be unsubstantiated and explains the production of red calves out of red by white matings as due to a factor or factors which

can modify the roan in the direction of red, roan being only observable when the calf is quite young. The 2nd part of the paper deals with the inheritance of the pied condition. The writer shows this to be recessive with modifying factors, as in the case of the Holstein-Freisian breed. It is natural that it should be superimposed on the red or roan of the Shorthorn, both breeds having a good deal of common heritage. A table is drawn up combining these factors and showing the phenotypes and genotypes of Shorthorn Coat color, and suggestions are made of how to breed the "Solid Red" and "Even Roan."—*Author.*

576. Stadler, L. J. **Variation in the intensity of linkage in maize.** Amer. Nat. 59: 366–370. 1925.—The author reports a preliminary investigation of genetic and environmental variation in crossing over in maize, based on backcrosses involving the C-W_x region. Crossing over was measured in 3 families: A, having 17.90 ± 0.15; B, having 22.62 ± 0.31; and C, having 25.85 ± 0.32. The differences between these families in the rate of crossing over is found to be significant, even when subjected to the more rigorous Bessel's formula. Although the families differed in their flowering period the crossover differences could not be attributed to this factor. Two ears from the same plant were found to have widely different crossover percentages, suggesting that environmental conditions during maturation are an important factor. Thirty-three plants in a single family furnished material for comparing the rate of crossing over in upper and lower ears. Of these, 20 gave a higher percentage in the upper ear, but the average difference was less than 1% and was not statistically significant.—*J. H. Kempton.*

577. Stroman, G. N. **Thirty-five years of close breeding.** Jour. Heredity 16: 87–88. *1 fig.* 1925.—The history of a seemingly homozygous strain of corn, which was grown by a farmer continuously for 35 years, is given. This farmer, by selecting to a certain ideal year after year, has saved some very good characteristics of an old native corn as a basis for present day methods of improvement. This strain of corn, "Cook's Old Native Blue Grain," is remarkably uniform as to size and conformity of ear.—*Author.*

578. Stuart, A. B. **Sterility in lilies.** Gard. Chron. [London] Ser. III. 75: 209, 256. *Fig. 105–115.* 1924.

579. Treboux, O. **Beobachtungen über Vererbung von Kornfarbe und Anthocyan beim Roggen. [Observations on the inheritance of grain color and anthocyan in rye.]** Zeitschr. Planzenzücht. 10: 288–291. 1925.—It is often difficult to distinguish pure yellow rye grains, for as few as 2 or 3 blue-green cells may be found scattered in the otherwise yellow aleurone layer. Such a plant acts as a heterozygote. Homozygotic yellow grains may be distinguished when the yellow is linked with absence of anthocyan, affecting the entire plant. Using such plants as parents, very clear cut Mendelian ratios were observable in comparison with rather indefinite ratios noted by other observers. Ratio discrepancies were found in certain families.—*L. R. Waldron.*

580. Warren, D. C. **Inheritance of rate of feathering in poultry.** Jour. Heredity 16: 13–18. *Fig. 4–6.* 1925.—Crosses between Single Comb White Leghorns and Jersey Black Giants showed that the difference in rate of feathering exhibited by these 2 breeds is due to a sex-linked factor. The slow-feathering condition of the Jersey Black Giants was found to be dominant to the rapid-feathering characteristic of the White Leghorns. The basis of classification was the age at the time of appearance of tail feathers. In over 600 offspring from various types of crosses, the character was inherited in a manner characteristic of the sex-linked group in the fowl. The character should be of value in future studies of the sex-linked group, since it is juvenile in expression, segregates in a clean-cut manner, and does not interfere with the expression of other characters of the group.—*Author.*

581. Warren, Paul Alanson. **Genetic studies in Lycopersicum. I. The heredity of fruit shape in the garden tomato.** Papers Michigan Acad. Sci. 4: 357–394. 1924.—Crosses between 10 varieties of the garden tomato studied in the 1st and 2nd generations have given results in size of fruit and fasciation, which are interpreted on the basis of complementary factors. Genotypes having both A or B or both have shallow fruits. Similarly, genotypes having both F and E produce non-fasciated fruits, while those without F or E, or both, have fasciated fruits. According to this hypothesis it is possible to have a fruit size larger or smaller than either parent.—*D. F. Jones.*

582. Winge, Ö. **Contributions to the knowledge of chromosome numbers in plants.** Cellule 35 (Vol. jubilaire V. Grégoire, Ire partie): 303-324. *2 pl., 43 fig.* 1925.—Chromosome numbers are given for species in 20 widely separated genera. With the exception of the genus *Hypericum* and possibly *Erophila* the chromosome numbers determined by the author and other investigators support his view that closely related species belong to one and the same arithmetical series of chromosome numbers. Due to the diversity of size and number of chromosomes within a genus, the author holds that in related organisms, chromosomes should be regarded from a genetic standpoint as follows: In forms with large chromosomes, the gene elements in each locus are more highly propagated than in forms with small ones. In forms with many chromosomes (polyploid types) the factors are in the main repeated in each individual set of chromosomes.—*A. E. Longley.*

583. Wriedt, Chr. **Colorsided cattle.** Jour. Heredity 16: 51-56. *Fig. 10–21.* 1925.—The article describes a color pattern of cattle found in Europe, Africa and Asia, and in 2 other species of the Bovidae, *Bos Indicus* and yaks (*Pöephagus Grunniens*). The croup, back, neck, dewlap, underside of chest, belly, and udder, are white; often there is a white band across the foreleg, and the tail is often white. The sides are solid-colored, red or black. The colorsided pattern appears to be incompletely dominant to the unicolored (self) pattern and completely dominant to the pied pattern of the Holstein-Friesian.—*R. Cook.*

584. Wriedt, Chr. **Formalism in breeding of livestock in relation to genetics.** Jour. Heredity 16: 19–24. *2 fig.* 1925.—It is shown that in different breeds—especially in cattle—pattern and color are required that have no relation to economic characters. Selection in practical breeding does not eliminate the undesirable characters, if the factors of these are recessive. For example, if the factor for the undesirable character is dominant, it is possible by selection to eliminate the character, but intense selection in this case can also harm a breed. The author concludes that genetic and pedigree research has shown that in animal breeding for economic purposes, there is no reason to select for other than economic characters.—*Author.*

585. [Zaitsev, G. S.] Зайцев, Г. С. **Цветение, плодообразование и раскрытие коробочек у хлопчатника.** [**Flowering, fruit formation and dehiscence of the bolls of the cotton plant.**] (English Summary.) Труды по Прикл. Ботан. и Селекции. [Bull. Appl. Bot. and Plantbreed.] 13^2: 391–460. 1923.—The work represents a compilation of the observations on the biology of cotton that was carried on during 1915–1918, along with general investigations of the variability and heredity in this plant. The objects of study were the succession of the phases, the correlation of the length of the different phases, the succession in the opening of the blossoms and the dehiscence of the bolls, in connection with the nature of branching, pollination, natural crossing, and other allied questions.—*E. Sinskaja.*

586. [Zalenskii, V. R., and A. V. Doroshenko.] Заленский, В. Р., и А. В Дорошенко. **Цитологическое исследование ржано-пшеничных гибридов.** [**Cytological investigation of rye-wheat hybrids.**] Труды по Прикладн Бот. и Селекции [Bull. Appl. Bot. Plantbreed.] 14^1: 185–210. 1925.—These cytological investigations were conducted on rye-wheat hybrids from F_1 up to F_6. Along with a quite normal division of the somatic cells, great anomalies at the moment of the reduction division, studied on the pollen mother-cells, were observed and were particularly prominent in F_1. The above mentioned anomalies chiefly manifest themselves in the absence of typical bivalent chromosomes in the 1st division; all chromosomes are univalent, form no typical equatorial plate and are irregularly scattered all over the cell. The movement of the chromosomes to one or the other pole is occasional, not simultaneous; thus, when the daughter nucleus is formed, the chromosomes which lagged behind, form caryomeres which further on give rise to minute pollen grains. Out of 1 pollen mother-cell, 5–7 pollen grains of quite abnormal structure may be formed, which are sterile. The pollen of F_1 not being functional, fertilization cannot take place except through repeated attempts at pollination with wheat or rye. Beginning with the F_2, the hybrids self-pollinate and may be divided into 3 principal groups: (1) Hybrids in which the peculiarities of wheat prevail; (2) hybrids showing a predominance of rye characters; and (3) hybrids showing intermediate characters. The last mentioned group is the least fertile. In the subsequent generations the segregation of the parental characters leads to the appearance of pure parental types as

well as to an increase of fertility. With the segregating out of the morphological peculiarities of the parental types and a return to normal fertility, a gradual regulating of the cytological processes, leading to a normal reduction division, is observed.—*Dorochenko.*

587. Zapparoli, T. V. **Broken seeds in maize.** Jour. Heredity **16**: 267-270. *Illus.* 1925.—Broken maize seed occur on corn varieties cultivated in Italy. The character first becomes manifest as a sudden cleft of the pericarp, which causes a more or less deep alteration of underlying materials, chiefly of the aleurone layer and of vitreous and mealy endosperm. The phenomenon occurs in greater or less degree every year, and fluctuations in the expression of the character are due principally to seasonal variations of the weather at time of ripening, but also, undoubtedly, to the variety. The author shows that there is a precise separation of types which appear in the 1st or in the 2nd generation and presents evidence that the character, "broken seeds," in maize is heritable.—*Author.*

588. [Zhegalov, S. I.] Жегалов, С. И. **Скрешивание пленчатых овсов сголыми. [The crossing of naked oats with different hulled forms.]** Научноагрономический журнал. (Jour. Landw. Wissen.) **No. 2**: 130–141. Moscow, 1924.—The work of Zinn, Surface, and others, has given us data on *Avena nuda* L. x A. *sativa* L. var. *trisperma* Schübl. and *A. nuda* x A. s. *montana* Al. Crossing A. *nuda* with *A. Ludoviciana* Dur. (f. *typica*), in F_1 and F_2 gave hybrid plants that exhibited the remarkable fact of a transference of characters in part of the spikelet, where as under other circumstances, it did not occur. In F_1 the hairiness of the glumes of the 1st grain, in case the glumes themselves are thin, is carried over to the 2nd and 3rd hull. In F_2 the torus ring is transferred, and with it the closely associated hairiness at the base of the grain. The so-called peculiarity mentioned in connection with *Avena nuda* is closely associated with hybrid plants and occurs only in hulled segregates. *A. nuda* × *A. byzantina* C. Koch shows lessened fertility, especially in F_2. In F_2 hybrid plants, tufts of hair develop at the base of the 2nd and 3rd grain, while the outer grains possess thin glumes.—*A. Mordwinkina* (*transl. by Orland E. White*).

HORTICULTURE

F. C. Bradford, *Editor*

(See also in this issue Entries 1, 7, 10, 22, 138, 274, 306, 314, 322, 325, 420, 447, 448, 514, 515, 549, 554, 562, 564, 578, 735, 738, 954, 959, 960, 961, 1068, 1303)

589. Anonymous. **Bird of paradise flower** (Strelitzia reginae). Missouri Bot. Gard. Bull. 10. *27–28. Pl. 6.* 1922.

590. Anonymous. **Floral color standards for Nymphaeas.** Missouri Bot. Gard. Bull. 10. *131–133.* 1922.—Thirty-nine varieties growing in the Garden are described according to Ridgway's "Color Standards and Nomenclature."—*O. T. Wilson.*

591. Anonymous. **Great laurel magnolia or Bull Bay.** Missouri Bot. Gard. Bull. 10. *37–38. Pl. 7.* 1922.

592. Anonymous. **Hardy exotic plants suitable for the gardens of Missouri and adjoining states. (Continued.)** Missouri Bot. Gard. Bull. 9. *48–53.* 1921.—This is a continuation of the list (Ibid. 9. *20–25*, 1921), including shrubs with conspicuous flowers.—*O. T. Wilson.*

593. Anonymous. **Helianthus angustifolius.** Missouri Bot. Gard. Bull. 9. *109–110. Pl. 26.* 1921.

594. Anonymous. **Herstellung von Obstweinen mittels Edelhefen. [Production of fruit wines by improved yeasts.]** Gartenwelt **28**: 352–353. 1924.—The writer encourages the use of high class yeasts in the manufacture of wines derived from various fruits.—*J. C. Th. Uphof.*

595. Anonymous. **Irises.** Missouri Bot. Gard. Bull. 13. *39–50. Pl. 5–15.* 1925.—This is a popular discussion of the culture of irises, followed by a list of the best varieties.—*O. T. Wilson.*

596. Anonymous. **Japanese morning-glories.** Missouri Bot. Gard. Bull. 10. *113–117. Pl. 14–16.* 1922.—Complete cultural directions for overcoming the usual difficulties with these plants are offered.—*O. T. Wilson.*

597. Anonymous. **Neue spätblühende Fliederarten. [New late flowering Lilac species.]**

Gartenwelt 28: 278. 1924.—A number of *Syringa* species have been tested which have been introduced recently from China. Some of these are very ornamental. *Syringa Wolfi* has the appearance of *S. villosa;* its inflorescence reaches a length of 30 cm.; flowers are light violet and open in June. *S. reflexa* resembles the former; the tree is broader; flowers are pink and appear until July. *S. Komarowii* produces deep violet flowers on inflorescences 15 cm. long. *S. Sargentiana, S. Sweginzownii, S. Wilsoni,* and *S. tomentosa* are also mentioned. All species are hardy. *Parasyringa sempervirens,* producing white flowers on dense panicles, is ever green. It is grown only in the Botanical Garden at Munich; nothing is known as to its hardiness.—*J. C. Th. Uphof.*

598. ANONYMOUS. **New hybrid Spiraea.** Missouri Bot. Gard. Bull. 9. *110. Pl. 27.* 1921.—A cross between *Spiraea salicifolia* and *S. douglasii* is reported and described.—*O. T. Wilson.*

599. ANONYMOUS. **Onions tried at Wisley. 1923.** Jour. Roy. Hort. Soc. 49: 262–267. 1924.—One hundred and twenty-two stocks were entered for trial. Some confusion of variety names is reported and it was the exception rather than the rule to find a perfectly true stock. Seed raised in California almost always produce plants that mature a fortnight earlier than plants from English or European seed. A classified list with awards and brief descriptive notes is given.—*J. K. Shaw.*

600. ANONYMOUS. **Plants of our local flora which have been used by man as food.** Missouri Bot. Gard. Bull. 10. *102–110.* 1922.—One hundred and seventeen species are listed and comments made upon their utility.—*O. T. Wilson.*

601. ANONYMOUS. [**Practical horticulture.**] (In Chinese, translated from the Japanese by C. C. CHANG.) Jour. Ministry Agric. and Commerce Republic of China 11^1: 23, 1924; 11^2: 10, 1924; 11^6: 9, 1925.—The practice of vegetable gardening aims at a 3-fold purpose, says the Japanese author. It will utilize small areas of land around the residence that otherwise would be idle; it will provide recreation and exercise for leisure hours; and it will furnish a constant supply of fresh vegetables for domestic consumption. The important bearing of vegetables upon daily life is illustrated by various examples. In Japan, investigations show that there is a constant increase in the number of families engaged in the practice of vegetable gardening. Statistics of monthly consumption for different kinds of vegetables per family of 10 have been made, after a thorough, 5-years' investigation. A well prepared working schedule for both summer and winter crops is given.—*Solanum melongena* L. (commonly called Chao Tzu by the Chinese). This tropical plant is reported to have 13 Chinese synonyms with authentic references, and has been under cultivation for more than 4,000 years. It was introduced into China through Siam in ancient times. It thrives equally well in Japan. In addition to describing the plant, the author gives a thorough discussion of its culture and distribution. Characteristics of varieties from the standpoint of their growing seasons, with illustrations, are given.—A thorough discussion of *Solanum* seed selection is presented, including the proper care of the seed from the time of harvest to the next growing season. Seed are generally sown broadcast in properly prepared seed beds; MnO_2 is applied to fertilize the young seedlings on account of its quick effect. Lists of insect and fungous pests of *Solanum* with remedial measures are given in detail.—*C. Y. Chiao.*

602. ANONYMOUS. **Record of short hardwood cuttings.** Missouri Bot. Gard. Bull. 9. *77–85.* 1921.—Dormant cuttings of 227 species and varieties were tested in greenhouse sand-beds. Tabulated results are given.—*O. T. Wilson.*

603. ANONYMOUS. **Russland.** [**Russia.**] Gartenwelt 28: 591. 1924.—The former imperial nurseries in Petrograd have become important nurseries for the city. Thousands of chrysanthemums, calceolarias, cinerarias and dendrobiums are grown. Flower shops in Petrograd always have flowering orchids for sale. The smaller nurseries are still in a difficult position and therefore cannot grow plants which present difficulties; they usually raise *primula obconica,* cut flowers, asters, *Matthiola annua,* etc.—*J. C. Th. Uphof.*

604. ANONYMOUS. **Shading greenhouses.** Missouri Bot. Gard. Bull. 10. *82–83. Pl. 11.* 1922.

605. ANONYMOUS. **Tetradenia Goudotii, a rare Madagascar shrub.** Missouri Bot. Gard. Bull. 13. *25–26. Pl. 4.* 1925.

606. Anonymous. **The American holly for St. Louis.** Missouri Bot. Gard. Bull. 8. *125–126. Pl. 16.* 1920.

607. Anonymous. **The American sycamore.** Missouri Bot. Gard. Bull. 10. *80–82. Pl. 10.* 1922.

608. Anonymous. **The cocoanut palm.** Missouri Bot. Gard. Bull. 9. *137–142. Pl. 30–31.* 1921.

609. Anonymous. **The giant cactus.** Missouri Bot. Gard. Bull. 10. *117–118. Pl. 17.* 1922.

610. Anonymous. **The ginger lily.** Missouri Bot. Gard. Bull. 10. *79–80. Pl. 9.* 1922.

611. Anonymous. **The ripening processes of grapes.** Jour. Dept. Agric. Union South Africa 9: 118–120. 1924.—Experiments were made during the season on 4 varieties of grapes with a view to arriving at some simple test which would express the degree of ripeness numerically in such a way that ordinary intelligence could apply it. Determinations were made of the density, sugar and acid contents, etc., at different times. The greatest change in the berries occurred not later than March 7 and after that period there was little constitutional change. Ripeness (equilibrium between various constituents) occurs about March 14. The greatest change takes place between February 21 and March 7; this is the period of ripening. These conclusions were found to be in accord with opinions based on taste.—*L. I. Goldblatt.*

612. Anonymous. **Trapa bicornis (Bull's Head).** Missouri Bot. Gard. Bull. 9. *19–20. Pl. 13.* 1921.

613. Anonymous. **Trial of lettuce at Wisley.** Gard. Chron. [London] Ser. III. 77: 171. 1925.—A list is given of varieties tested and results are stated.—*P. L. Ricker.*

614. Anonymous. **Unusual late-flowering period of plants.** Missouri Bot. Gard. Bull. 9. *126–128.* 1921.—One hundred and three species of plants bloomed in the garden as late as Nov. 9. These are listed.—*O. T. Wilson.*

615. Anonymous. **Vegetative propagation of orchids.** Missouri Bot. Gard. Bull. 13. *73–75. Pl. 20–21.* 1925.—A new method successfully employed at the Garden is described.—*O. T. Wilson.*

616. Anonymous. **Victoria hybrida imperialis.** Gartenwelt 28: 126–127. *1 fig.* 1924. —*Victoria hybrida imperialis* is a 1923 novelty from Haage & Schmidt in Erfurt. It withstands cooler water than *Victoria regia* and may be grown in smaller basins, having a diameter of 4½ m.—*J. C. Th. Uphof.*

617. Bade, E. **Bringing the carboniferous period into the greenhouse.** Sci. Amer. 131: 246. *3 fig.* 1924.—This paper presents a popular explanation of a patented device for supplying plants with an artificial supply of carbon dioxide for the stimulation of growth.—*Chas. H. Otis.*

618. Bell, James C., and Ernest H. Wiegand. **Extraction and clarification of pectinous fruit juices.** Oregon Agric. Exp. Sta. Circ. 63. *1–12. 4 fig.* 1925.—To make good jelly, fruits must contain sufficient pectin. Such fruits are crabapples, sour apples, currants, grapes, red raspberries, loganberries, gooseberries, quince, cranberries and sour plums. All fruits should be partly cooked before the juice is extracted in order that the pectin may be rendered soluble so that it may be extracted with the juice. Great pressure is necessary to extract all the pectin. A heavy screw or hydraulic press is preferable. A test for pectin consists of adding an equal or double amount of 95% alcohol to a sample of juice. Pectin present will form a jelly-like mass. A pectinous juice contains solids and suspended bodies which should be removed. A centrifuge is recommended for removing larger solid bodies and a filter for the final clarification. For filtering, a closely woven filter cloth or other filter is recommended, and celite, a porous siliceous mineral should be added to the juice. This forms a layer on the filtering surface and increases the efficiency. To force the juice through the filter, a filter pump or vacuum pump may be necessary. After clarification the juice may be either stored after sterilization or concentrated into jelly in a vacuum pan, as desired.—*C. E. Owens.*

619. Bethge, W. **Der Schnitt der Johannisbeersträucher.** [Pruning currants.] Gartenwelt 28: 365–366. 1924.—The proper time for pruning currant shrubs is June and July, when the plants form their 2nd growth. When wood is almost matured they are pruned at about

5 cm. from the place where the growth started. Differing from the twigs formed in spring, the 2nd growth (Johannistrieb) has a lighter foliage. Summer pruning stimulates a better development of fruit. After pruning, the shrubs should receive liquid manure. In winter only the dead and superfluous growth is removed.—*J. C. Th. Uphof.*

620. Bioletti, F. T. **The basis of grape standardization.** California Agric. Exp. Sta. Circ. 293. *1–15.* 1925.—The Balling degree test is the simplest and most reliable that can be used practically in determining the degree of ripeness for the standardization of shipping grapes. The standardization law of 1921 requires modifications to include adjustments of the required Balling degree to suit the varying conditions of variety and season.—*A. R. C. Haas.*

621. Blackmon, G. H. **Report of the pecan culturist.** Florida Agric. Exp. Sta. Ann. Rept. 1924: 72R–75R. 1924.—The area suitable to commercial pecan growing in Florida is approximately from Jacksonville west to Pensacola and south to Gainesville. Experiments on rootstock, varieties, fertilizers and diseases are under way. The department being new, no details are given. Thermogen is of no value to young pecan trees.—*J. C. Th. Uphof.*

622. Brereton, W. leGay. **Manurial experiments with citrus trees.** Agric. Gaz. New South Wales 36: 513–518. 1925.—Experiments were planned to determine (1) the effect of potash on citrus trees and the comparative value of muriate and sulphate and (2) the relative values (a) of superphosphate and bone dust and (b) of sulphate of ammonia and nitrate of soda. Results are given for only 1 year. The fruit were larger from the potash than from the control plats. The yield of fruit was likewise larger from the potash plats. The largest yields resulted from application of the muriate. The size increase of fruit was not brought about through puffing. In testing carriers of phosphorus and nitrogen, larger fruit were secured from the use of superphosphate in connection with dried blood than from bone dust used with dried blood. Sulphate of ammonia used with superphosphate gave larger fruit and yields than were secured from nitrate of soda with superphosphate. Potassium sulphate was used for all plats in the phosphorus and nitrogen experiments.—*L. R. Waldron.*

623. Broadfoot, H. **The drying of figs.** Agric. Gaz. New South Wales 36: 455. 1925.

624. C., C. F. **Rhododendrons of the lapponicum series.** Gard. Chron. [London] Ser. III. 77: 335, 347. 1925.—Brief descriptions are given of 64 species of rhododendron.—*P. L. Ricker.*

625. Chow, M. C. **[Analysis of Lungan], Euphorbia longana Lamarck.** (In Chinese.) Jour. Ministry Agric. and Commerce Republic of China 11[4]: 2. 1924.—The lungan is highly praised by the Chinese as an edible fruit, and it is especially valued because of its tonic property. A determination of the percentage of water, sugar, ash, and carbohydrates comprises the bulk of this analytical work.—*C. Y. Chiao.*

626. Christiansen, Edv. **Dyrkningsforsog med Sorter og Stammer af Tomater. 1919–1921.** [Cultivation experiments with varieties of tomatoes.] Tidsskr. Planteavl. 30[4]: 586–596. 1924.—Experiments recounted in this paper indicate that Denmark's climate is not sufficiently warm to produce tomatoes in the open field for market, although it can be done successfully in small wind-protected areas. Attempts are being made to develop a variety suitable for growing in open fields under Danish conditions. The disease problem is serious.—*Albert A. Hansen.*

627. Christie, A. W., and L. C. Barnard. **The principles and practice of sun-drying fruit.** California Agric. Exp. Sta. Bull. 388. *1–60. 1925.*

628. Cole, F. E. **Packing apples in the standard box for farm produce.** Massachusetts Fruit Growers Assoc. Rept. 31: 142–148. 1925.

629. Collins, J. H. **Growing our own bananas.** Sci. Amer. 131: 86, 138–139. *3 fig.* 1924.—This paper tells how Florida is establishing a new crop in competition with more tropical lands. Three varieties seem best suited to Florida: Cavendish, Hart and Orinoco.—*Chas. H. Otis.*

630. Crandall, Charles S. **Blooming periods of apples.** Illinois Agric. Exp. Sta. Bull. 251. *113–145.* 1924.—Material in this bulletin was taken from records kept on 106 varieties of apples for periods ranging between 10 and 16 years. There cords included dates of 1st bloom, full bloom, and petals falling, also an estimate of the amount of bloom. Flowering periods are very variable; in general they are shorter in Illinois than in Virginia, New York,

Oregon, and England. The flowering period in Illinois ranged from 10 to 22 days. The earliest date of opening flower was April 2; the latest date of petals falling was May 21. Factors influencing the blooming period of apples are extremely complex. Climate is an important factor, but its influence is modified greatly by physiological characteristics which are very difficult to isolate or control.—*H. A. Lunt.*

631. Dakkus, P. **Amorphophallus titanum Beccari.** Gard. Chron. [London] Ser. III. 76: 302–303. *Fig. 108–111.* 1924.—This is a description of the plant and conditions of its growth and culture at the Buitenzorg Botanical Garden.—*P. L. Ricker.*

632. Dannhauer, Fritz. **Azalea indica.** Gartenwelt 28: 244–245. 7 *fig.* 1924.—Varieties of *Azalea indica* are much cultivated in Saxony and Belgium. They require a well drained sand and heather soil. Plants are propagated from seed and cuttings and by grafting. Cuttings are made from half ripe wood and are kept at 20–25°C. They root within 4–6 weeks. As stock for grafting, *Azalea phoenicea* and *A. concinna* are used for summer, and Cunningham's White Rhododendron for winter propagation. For forcing, *A. phoenicea* is the best stock. A number of varieties suitable for forcing are mentioned. Plants are raised in greenhouses and frames. Cultural directions are given in detail.—*J. C. Th. Uphof.*

633. Dicks, S. B. **Vegetable marrow (Cucurbita pepo L.).** Gard. Chron. [London] Ser. III. 77: 224–225. *Fig. 92–93.* 1925.—Although the plant has long been cultivated for the fruit, the seed are the most nutritive part of the fruit; in Italy they are an article of every day consumption, and may be seen in the markets in considerable quantity along with nuts. The figures are from Dodonaeus, about 1554, and figure 92 shows the form of fruit known in America as summer squash. The history of this vegetable is traced through some of the older writers and many varieties are traced from more recent origin and from horticultural exhibits.—*P. L. Ricker.*

634. Diehl, H. C. **The chilling of tomatoes.** U. S. Dept. Agric. Dept. Circ. 315. *1–5.* 1924.—An investigation was undertaken to determine the effect on tomatoes of temperatures slightly higher than their freezing point. Within certain time limits an exposure to low temperatures is not injurious to tomatoes provided they are not frozen.—*L. R. Hesler.*

635. Dix, J. F. Ch. **Holländische Blumenzwiebelskulturen. [Dutch bulb growing.]** Möllers Deutsch. Gärtnerzeitg. 40: 210–212, 226, 238–240. 1925.—In 1860 Dutch bulb exports amounted to 1,000,000 gulden; in 1910, they reached 15,000,000 and in 1925 nearly 30,000,000 gulden (1 gulden is $0.40). At present 5000 ha. of bulbs are grown; in 1860 there were but 300 ha. Dutch bulb growers are united into 3 strong societies. The activities of one pertain to the interests of the growers, the work of the others to the export trade. A general description is given of hyacinths, tulips, etc., as to preparation for forcing, for planting on beds, etc. Several varieties are described.—*J. C. Th. Uphof.*

636. Dungern, Frhr. von. **Dendrologische Beobachtungen. [Dendrological observations.]** Mitteil. Deutsch. Dendrol. Ges. 31: 274–275. 1921.—*Spiraea sorbaria* is not attacked by stags and similar wild animals.—*J. C. Th. Uphof.*

637. Fleischmann, Carl. **Die deutschen Riesen-Remontant-Nelken. [The German Giant-Remontant-Carnations.]** Gartenwelt 28: 44. 1924.—This carnation race was originated by Gustav Wolf in Leipzig-Eutritzsch. It is suitable for winter flowering. The race originated from a cross between the old remontant carnation and the American. Half matured slips are taken in August from the flowering stalk and placed in sand; cuttings should not be set too deep. They root in 3 weeks. In April they are planted outside. In September they are brought into the greenhouse and they flower the succeeding January. Cultural directions are given in detail. Several varieties are described.—*J. C. Th. Uphof.*

638. Fleischmann, Carl. **Treibflieder. [Lilacs for forcing.]** Gartenwelt 28: 132–133. 1924.—A description is given of propagation, and forcing of lilacs (*Syringa*). Seed are collected in October and November and sown in March in cold frames. In May the seedlings are planted on beds at 10 to 15 cm. In autumn seedlings are sorted into those of 2–3 and 5–8 cm. Land must be deeply ploughed and well fertilized. Seedlings are budded in July and August. Buds are inserted on the south side, about 5 cm. from the surface of the ground. Preparation for forcing is extensively described. Forcing starts at the beginning of December; earlier forcing is not advisable. Treatment and temperature are described. The best varieties for

early forcing are Marie Legaye and Charles X, and for late forcing, Andenken and Ludwig Späth.—*J. C. Th. Uphof.*

639. Gallard, L. **Notes on some varieties of strawberries.** Agric. Gaz. New South Wales 36: 484. 1925.—Notes are given on 5 varieties. Melba is considered practically the same as Creswell's Seedling.—*L. R. Waldron.*

640. Galloway, B. T. **Bamboos: their culture and uses in the United States.** U. S. Dept. Agric. Dept. Bull. 1329. *1–45. Pl. 1–14.* 1925.—Sixty species of bamboos, representing 12 genera, have been introduced into the U. S. A. by the Department of Agriculture. *Phyllostachys bambusoides* Sieb. & Zucc., the giant timber bamboo; *Phyllostachys nevinii* Hance, stake and forage crop bamboo; *Phyllostachys* sp., dwarf hardy bamboo; *Phyllostachys mitis* A. and C. Riviere, smooth-sheath edible bamboo; *Phyllostachys edulis* (Carr.) H. de Lehaie, hairy sheath edible bamboo; and *Bambusa tulda* Roxb., the Calcutta fish rod bamboo, have been specially tested, propagated and distributed for the purpose of developing domestic supplies. The more important species for domestic and commercial uses are described and details of propagation and utilization given. A chapter is devoted to bamboos as ornamentals, 13 species being described. The 2 concluding chapters are devoted to diseases and insects.—*Author.*

641. Gielsdorf, K. **Die Kakteen in der Kultur.** [Cactus growing.] Gartenwelt 28: 34–36, 59, 106–107. 1924.—A description is given of the cultural peculiarities of the principal species of cacti. Growing of cacti in summer and winter, hybridization, reproduction from seed, cuttings, layers and grafting are discussed. A description is given of the cultivation of the species most common in Germany.—*J. C. Th. Uphof.*

642. Goldammer, H. **Empfelendswerte Salatsorten.** [Recommendable lettuce varieties.] Gartenwelt 28: 530. 1924.—Böttner Trieb and Kaisers Trieb are the best for forcing. The earliest for outdoor culture is Maikönig; it is much grown for the market. Gelbe and Braune Trotzkopf are old varieties. Good heads are produced by Hochheimer Dauerkopf. Riesen-Kristal produces good and large heads.—*J. C. Th. Uphof.*

643. Goossens, V. **Contribution à l'etude du cocotier au Congo-Belge. III. Note sur les coctiers du Jardin botanique d'Eala.** [Contribution to the study of coconuts in the Belgian Congo. III. The coconuts of the Botanic Garden of Eala.] Bull. Agric. Congo-Belge 13: 47–48. 1922.—This is a description of the growth conditions of 79 coconut trees in full bearing at Eala. The total production for 3 years was 2,722 nuts, an average of 11 nuts per tree per year. The age of the trees is unknown as are the weight of the nuts and yield of copra, since the fruit were used for seed. A planting of 190 old nuts made in 1917 gave a germination of 54%.—*P. van Oye (translated).*

644. Gourley, J. H. **Soil management and fertilization of orchards.** Ann. Rept. Massachusetts Fruit Growers' Assoc. 31: 47–52. 1925.—Stayman and Delicious apple trees 9 years old yielded more under a system of mulching than under cultivation and the cost of growing was less. Nitrates under sod averaged 3.18 parts per 1,000,000 (p. p. m.); under clear tillage, 17.40 p. p. m.; and under tillage and cover crop 33.91 p. p. m.—*J. K. Shaw.*

645. Gourley, J. H. **The pollination problem in the modern orchard.** Ann. Rept. Massachusetts Fruit Growers' Assoc. 31: 133–141. 1925.

646. Graham, R. J. D., and L. B. Stewart. **Vegetative propagation of Ornithogalum and Drimia.** Trans. & Proc. Bot. Soc. Edinburgh 29[1]: 69–71. 1924.—Vegetative reproduction in species of *Ornithogalum* takes place by axillary buds produced in the axils of scale leaves and also by bulbils on the abaxial surface of the swollen cylindrical leaf bases which form the tunicate bulb. Bulbs cut in half and exposed to daylight in a dry bulb pit at 60° F. until the mucilage from the injured surface was dry, produced from the isolated scales of these bulbs numerous buds when the scales were laid upon slightly moist sand. In *Drimia ciliaris* Jacq., bud formation can be induced either in the parenchyma cells of the scale, or in the callus formed as a result of injury. All attempts to induce bud formation on the abaxial surface have failed. This may be associated with the absence of vascular tissue from the abaxial surface.—*Thomas Swarbrick.*

647. Hanses. **Sorbus aucuparia var. dulcis.** Gartenwelt 28: 266. 1924.—*Sorbus aucuparia* var. *dulcis* came originally from the Sudeten Mountains in Moravia at an elevation

of 700 m. This variety has become better known during the last 30 years on account of its sweet fruit. Its flowers are not susceptible to late frosts. The fruit are used for different kinds of preserves and are thought to have commercial possibilities.—*J. C. Th. Uphof.*

648. Hartman, Henry. **Preliminary studies relating to the harvesting and canning of sweet cherries.** Oregon Agric. Exp. Sta. Circ. 61. *1–22. 5 fig.* 1925.—Both the fresh fruit and the canning qualities of sweet cherries are affected by time of picking. During the ripening period, sweet cherries show a gradual though not striking decrease in firmness, a pronounced increase in sugars and other soluble solids, a reduction of the acid content, and a marked increase in size. Fruit picked either too early or too late is of poor quality. Napoleon developed the best quality when picked between June 30 and July 6; Lambert, between July 14 and 19. Storage experiments indicated that the fruit never improves in quality after picking. Shipping quality was not affected by time of picking. A maturity test based on the specific gravity of the juice may be feasible. Low humidity and free air movement in the storage room resulted in excessive loss of weight.—In canning operations, cherries picked later gave a higher sirup cut-out than those picked earlier. A correlation between the soluble solids of the raw juice and the sirup cut-out of the canned product was noted. Fully mature cherries gave a product of firmer texture than immature fruit. Early picked fruit showed more shrinkage in canning than later picked fruit. The color of the sirup in the canned product varies with the stage of maturity, being darker or richer in color in the more mature fruits.—*C. E. Owens.*

649. Hedrick, U. P. **Producing new varieties and some interesting new sorts.** Ann. Rept. Massachusetts Fruit Growers' Assoc. 31: 171–180. 1925.

650. Hermanns, Hubert. **Hortensienkulturer. [Hortensia growing.]** Gartenwelt 28: 461–463. 1924.—*Hortensia* varieties are propagated from soft wood cuttings. They root within 12 days at a temperature of 20°C. After 24 days they are transplanted. They may be either grown in pots or planted outside. The former method is more convenient; the latter method produces a better root system. They are potted first in May and again for the last time in June or early July. "Mdm. Emile Mouillère" is the earliest for forcing, followed by "Truffault."—*J. C. Th. Uphof.*

651. Herpers. **Kirschveredlungen. [Propagation of cherries.]** Gartenwelt 28: 136–137. 1924.—*Prunus Mahaleb* is the best stock when dwarf or espalier trees are desired. *Prunus avium* is recommended for standard cherry trees, both sweet and sour.—*J. C. Th. Uphof.*

652. Hertel, Franz. **Ein neuzeitliches Verfahren zur schnellen und billigen Pflanzung von Bäumen. [A new method in planting trees quickly and cheaply.]** Möllers Deutsch. Gärtnerzeitg. 40: 252–254. 1925.—Gains from the use of the explosive, Romperit-C, are reported. When placed in the soil at a depth of about 1 m. it loosens the soil for 3.5 sq.m. and a volume of about 5 cu.m. Hard layers in the soil are broken, enabling the air to enter the lower portions. By deep loosening of the soil a uniform moisture content is obtained during hot summers. Many data are available showing that trees not only produce more leaves and twigs but also the productivity of the trees has increased from the use of Romperit-C. An example is given of an orchard 10 years old, having the appearance of 18 to 20 years, due to the treatment. The parks of Leipzig showed excellent results and this explosive was used recently over an area of 50,000 sq.m. In planting trees much labor is saved by use of this explosive.—*J. C. Th. Uphof.*

653. Hetschold. **Cotoneaster multiflora reflexa als Hochstamm. [Cotoneaster multiflora reflexa as a standard tree.]** Möllers Deutsch. Gärtnerzeitg. 40: 197–198. 1925.—*Cotoneaster multiflora reflexa* is recommended as a standard tree. Its beautiful red fruits last a long time. It may be grafted on *Crataegus oxyacantha.*—*J. C. Th. Uphof.*

654. Howard, C. W. **Sericulture improvement in Southern China.** Lingnaam Agric. Rev. 1[1]: 31–46. *Pl. 6.* 1922.—Silkworms and mulberry trees of southern China originated from mongrel stock and are still different from those of other parts of China. Improvement consists in eliminating disease and selecting strains which are especially adapted to conditions in Kwantung Province. Some of these selected strains may eventually become definite species. Silkworms and mulberry trees are so intimately connected that improvements are being made in both at the same time.—*Charles S. Gibbs.*

655. Illinois Agric. Exp. Sta., Department of Horticulture. **A plan for the farm garden.** Illinois Agric. Exp. Sta. Circ. 278. 1–7. *Fig. 1–3.* 1924.

656. Jacob, H. E., and J. R. Herman. **Harvesting and packing grapes in California.** California Agric. Exp. Sta. Bull. 390. *1–44.* 1925.—From 1900 to 1924 the shipments of fresh grapes from California increased from 765 to 52,358 carloads, an average of 20% increase a year. Suitable methods of handling, packing, and shipping table grapes have been developed and are herein presented.—*A. R. C. Haas.*

657. Janson, A. **Blumenkohl Erfurter Zwerg.** [Cauliflower Erfurter Zwerg.] Gartenwelt 28: 53. 1924.—The writer compares the Erfurter Zwerg with other cauliflower varieties and comes to the conclusion that it is one of the best varieties for forcing as well as for planting outside. This cauliflower can be harvested in 145 to 155 days.—*J. C Th. Uphof.*

658. Janson, A. **Erfahrungen mit Bohnen.** [Experiments with beans.] Gartenwelt 28: 63–64. 1924.—Alpha and Saxa are early bearers. The time from sowing to harvesting is 36 to 40 days. Kaiser Wilhelm ripens 2 days later; it is very prolific. Weissgründige fadenlose Hinrichs Riese is considered by the writer as the best for canning.—*J. C. Th. Uphof.*

659. Janson, A. **Verjüngung von Obstpflanzungen mit Sprengstoffen.** [Renovation of orchards by explosives.] Gartenwelt 28: 284–285. 1924.—Near the outer root system at 3 m. distance 50-gram explosives are placed about 60–70 cm. deep in the soil. Through the explosion the soil is loosened. It is important that the explosion be directed downward. If it goes upward, especially in the case of picric acid-sylvit, the root system may be damaged. Sweet cherries especially may suffer, resulting in gummosis or attacks of *Dematophora necatrix.* Romperit-C explosions work downward and prove to be better than picric acid-sylvit. Peaches on St. Julien are more susceptible to injury from explosions than those on peach seedling. The time of blasting is important, it should be done during the dormant season, up to the end of April. At this time the crown of the tree should be pruned and liquid manure given after an explosion. Explosions in the fall seem to cause a too abundant formation of buds, especially of flower buds, with fewer foliage buds. The soil may rise only slightly and settle soon to its original situation. Some orchards 10–15 years old may be made productive again by this method.—*J. C. Th. Uphof.*

660. Jefferies, John H. **Report of the Citrus Experiment Station.** Florida Agric. Exp. Sta. Ann. Rept. 1924: 117R–120R. *2 fig.* 1924.—In propagation of citrus from root-stock by cuttings it was found that an abundance of cutting wood may be secured by pruning the outer branches of the progeny tree. This will stimulate a heavy growth of short, stocky shoots. Cuttings are made about 4 inches long and $\frac{1}{8}$ inch in diameter; only the lower leaves are removed. The cuttings should be kept damp all the time they are being rooted. When rooted they are transplanted to the citrus soil. A new method of giving a tree a new root system was obtained by girdling some young trees to force bud growth. After they had been banked in fall against freezing, a splendid root system was found the following spring.—*J. C. Th. Uphof.*

661. Jelitto, C. R. **Eryngium.** Gartenwelt 28: 421–422. *4 fig.* 1924.—Cultural directions are given for a number of *Eryngium* species suitable for various ornamental purposes.—*J. C. Th. Uphof.*

662. Kache, Paul. **Crinum Powelli.** Gartenwelt 28: 55. *1 fig.* 1924.—Crinum Powelli (*C. longifolium* × *C. Moorei*) is an excellent ornamental garden plant, flowering abundantly. It is grown also as a pot plant or in tubs. It should be kept in a greenhouse during winter.—*J. C. Th. Uphof.*

663. Kache, Paul. **Die Kultur der Poinsettien.** [Growing poinsettias.] Gartenwelt 28: 180–182. 1924.—Propagation, temperature relations and cultural directions are noted. The greater part are used for bouquets, a few are sold as pot plants. The following varieties are recommended; Cardinalis, Imperator, Plenissima, Trebstii and Alba.—*J. C. Th. Uphof.*

664. Karsten, Richard. **Zum Treiben der Cichorie.** [Forcing chicory.] Gartenwelt 28: 122. 1924.—Roots are harvested from the field and wintered close together in the ground under a 15 cm. layer of soil. They are forced as needed. From 2000 pounds of roots about 35 pounds of bleached leaves are obtained. Within 3 to 4 weeks, forced shoots are 10 cm. long. At that time the soil is carefully removed around the plants and the shoots are cut off above

the root. Roots which have been forced can be used as food for cattle and for sheep.—*J. C. Th. Uphof.*

665. Kühn, K. **Die Kultur der Dahlien für den Spätherbst.** [Growing dahlias for the late autumn.] Gartenwelt 28: 246–247. 1924.—The writer, who lives in Lewaschewo, Russia, states that to have dahlias flowering late in fall they may be grown in boxes during summer. When the 1st night frosts are feared the dahlias are placed in the greenhouse where they remain flowering until January.—*J. C. Th. Uphof.*

666. Kühn, K. **Gemischte Gemüsekulturen.** [Mixed vegetable growing.] Gartenwelt 28: 28–29. 1924.—Formerly vegetables were extensively grown in the Provinces Krowno, Groano and Mihilew in Russia. Land on which small grains were grown the previous year, is rented on an annual basis by Jews. Fields have an area of 10 to 15 desjatin (1 desj. is about 1 ha.). The land is ploughed once and is manured only when stable manure can be obtained cheaply. All work is done by hand as labor is cheap. Plants are grown in rows at 40 cm. distance. Usually cabbage, red beets, carrots, onions, bush beans and cucumbers are grown in successive rows; every 5th row is the same. Local varieties are grown. The succeeding year another piece of land is used.—*J. C. Th. Uphof.*

667. Kühn, K. **Rosenwünsche aus Russland.** [Roses in Russia.] Gartenwelt 28: 224–225. 1924.—Roses are much esteemed in Petrograd. The popular and the unsatisfactory varieties are enumerated. Since the beginning of the war, cultivation of roses has diminished; nothing was imported. During the revolution the last roses disappeared with the greenhouses. The long and severe winters in the north make rose growing difficult; gardeners in the south will secure better results.—*J. C. Th. Uphof.*

668. Küphaldt, G. **Vorschläge für die Bepflanzung der Strassen und Promenaden in deutschen Grosstädte.** [Planting streets and avenues in large German cities.] Gartenwelt 28: 86–87, 111–112, 146–148. 1924.—Along many streets of Berlin and other large cities of Germany it frequently happens that trees are planted which are not suitable. Furthermore, they are often planted too close together. Distances for *Platanus*, *Ulmus*, *Aesculus*, *Acer* and *Fraxinus* in Berlin are in many cases 10, sometimes only 7 or 5 m. apart. The distance should be 20 m. while species which remain low should be planted at not less than 8 m. apart. A number of trees are described in relation to their suitability with reference to width of sidewalks, smoke, drought, asphalt and light.—*J. C. Th. Uphof.*

669. L., K. **Wie steht es jetzt um den Gartenbau in Russland?** [Horticultural conditions in Russia.] Gartenwelt 28: 13. 1924.—Horticultural conditions in Russia have been very backward since the revolution. There is not sufficient material for greenhouse construction. Growing of fruit and ornamental trees is greatly diminished and badly managed. Trade in seed generally is reviving. Vegetable growing is increasing although not properly managed, as the land has been confiscated from the market gardeners and is now divided among the factory laborers.—*J. C. Th. Uphof.*

670. Meier, G. A. **When pruning the pear.** Agric. Gaz. New South Wales 36: 512. 1925.—General notes are given, in particular referring to the varieties Winter Nelis, Josephine, and Beurré Bosc.—*L. R. Waldron.*

671. Mowry, Harold. **Papaya culture.** Florida Grower 32[3]: 36. 1925.—The papaya is grown successfully throughout southern Florida. It is susceptible to frost. No named varieties are grown. Seed are planted in early winter. The spacing is 10–12 feet. One staminate tree is grown to 10 pistillate trees. Leaf spot is kept under control by a 4-4-50 Bordeaux spray.—*J. C. Th. Uphof.*

672. Mowry, Harold. **Report of Assistant Horticulturist.** Florida Agric. Exp. Sta. Ann. Rept. 1924: 56R–71R. 1924.—(1) With the exception of Satsuma oranges on *Citrus trifoliata* stock (in northern Florida) practically all citrus trees, under 3 years of age, regardless of stock, were killed to the bank by the frost. None of the *C. trifoliata* or *C. trifoliata* hybrids showed injury at 22°F.; bittersweet on higher ground showed little injury and Cleopatra mandarin showed least damage. Eight to ten year-old satsumas on *C. trifoliata* were not damaged. (2) There is great variation in fruiting habits of the tung-oil tree (*Aleuritis fordi*). The tendency of the majority of trees is to bear but 1 fruit to the twig. One tree bears its fruit in clusters; the average yield of this tree is much greater than that of the others.

It will be increased by budding and grafting. Patch budding or sprig grafting was successful from spring until late July; early working is preferable. Cuttings root slowly. (3)Thirteen varieties of *Rubus* are under observation. The Nessberry (dewberry-raspberry hybrid) fruited 15 months after planting. (4) A number of pears are being tried. (5) The older plantings of persimmons are either dead or past the stage of maximum production. Rootstock tests will be made. Most varieties of the Japanese persimmons, when grafted on native stock (*Diospyros virginiana*), are shortlived. (6) Sixty-two varieties of bunch grapes and 14 of Muscadine are under trial. (7) A planting was made of Mexican avocado varieties; only the hardy types are grown. Rootstock tests will be made to determine what effect the different types, as stocks, may have on hardiness of the scion. (8) An extensive list is given of ornamentals on the horticultural grounds.—*J. C. Th. Uphof.*

673. Nott, Francis. **More and better peonies.** Field Illus. 35⁹: 20–21. *4 fig.* 1925.—This is a general article on culture of peonies and the merits of different groups and more prominent varieties.—*H. O. Werner.*

674. Osborne, A. **The willows.** Gard. Chron. [London] Ser. III. 76: 390. *Fig. 325–326.* 1925.—Notes are presented on willows particularly suited to ornamental planting.—*P. L. Ricker.*

675. Peck, Gilbert W. **Pruning apple trees.** Ann. Rept. Massachusetts Fruit Growers' Assoc. 31: 72-92. 1925.

676. Petch, T. **The Brazil nut.** Gard. Chron. [London] Ser. III. 77: 349. *Fig. 147–150.* 1925.—This is a description of the fruit structure of the Brazil nut.—*P. L. Ricker.*

677. Pitt, J. M. **Onion trials on the lower north coast.** Agric. Gaz. New South Wales 36: 436. 1925.—Eight varieties were included in this trial. The maximum yield—15 tons per acre—was secured from Early Barletta.—Detailed notes are given.—*L. R. Waldron.*

678. Pynaert, L. **Le jardin botanique de Calcutta, Sibpur.** [**The Botanic Garden of Calcutta, Sibpur.**] Bull. Agric. Congo-Belge 11: 207-218. 1920.—This is an historical sketch and a description, particularly from a horticultural point of view, of the Botanic Garden of Sibpur.—*P. Van Oye (translated).*

679. Rehnelt. **Mandragora officinalis Mill.** Gartenwelt 28: 415. 1924.—*Mandragora officinalis* requires much lime and a warm situation. A great number of seed do not germinate. In southern Europe and the Orient 3 forms are distinguished: *M. vernalis* Bertol., *M. officinalis* Mill., and *M. microcarpa* Bertol.—*J. C. Th. Uphof.*

680. Rhododendron Society. **Members' notes.** Rhodendron Soc. Notes 2: 215–275. 1925.—This consists of miscellaneous notes, contributed by the members of the Society, on Rhododendrons in their various aspects, chiefly horticultural.—*Alfred Rehder.*

681. Rosenthal, H. **Die drei besten Rhabarbersorten.** [**The three best rhubarb varieties.**] Gartenwelt 28: 398. 1924.—Improved Victoria is suitable for early forcing. Dawes Challenge is probably identical with Amerikanischer Riesen, which is a very strong grower. The Sutton is as productive as the former, though its petioles are better colored. It has the advantage over Holsteiner Blut that the leaves grow straight; those of the latter are crooked. In Germany, rhubarb plants are set in the fall at 1 m. distance each way.—*J. C. Th. Uphof.*

682. Rössl, Johann. **Als Gärtner in Peru.** [**As gardener in Peru.**] Gartenwelt 28: 303. 1924.—Horticulture in Peru has not reached a high stage of development. Labor is performed chiefly by Japanese, Chinese, Italians and Spaniards. The principal roses are Frau Karl Druschki, John Laing, Kaiserin, Maréchal Niel and Nephatus. Most Dahlias are of the pompon group, with a few of the cactus group; no new varieties are grown. Roses and Dahlias are the only flowers used for bouquets and wreaths. Roses, jasmines, *Plumbago, Pelargonium* and *Achyranthes* are used for hedges. *Cyclamen* and *Primula obconica* are primitively grown as potplants. *Amaryllis*, Chrysanthemums, hydrangeas and ornamental herbaceous plants are unknown.—*J. C. Th. Uphof.*

683. Sandeman, Christopher. **El Jardincito Japones.** [**The Japanese garden.**] Gard. Chron. [London] Ser. III. 77: 352. 1925.—This paper presents a description of the author's 10-acre garden in southern Spain. It is Japanese only in its 2 stone lanterns and diminutive serpentine gutters. Notes are given on the plants grown, with seasonal and temperature factors.—*P. L. Ricker.*

684. Schauer, Siegmund. **Hortensien-Neuheit "Adele Schauer."** [Hortensia novelty "Adele Schauer."] Möllers Deutsch. Gärtnerzeitg. 40: 189. *1 fig.* 1925.

685. Schindler. **Beitrage zur Frage der Obstunterlagen.** [Stocks for fruit trees.] Gartenwelt 28: 156–158. 1924.—The writer emphasizes the importance of selection of the proper stock for grafting and budding of fruit trees. A number of varieties of peaches, plums, and apples suitable for stocks are mentioned.—*J. C. Th. Uphof.*

686. Schipper. **Die Bepflanzung der Spalierwande mit Obst.** [Planting fruit trees against walls.] Gartenwelt 28: 27. *1 fig.* 1924.

687. Schipper. **Früh und reichtragende Kernobstarten.** [Early and productive pomaceous fruits.] Gartenwelt 28: 52–53. *2 fig.* 1924.—Early bearing and productive varieties of apples and pears are considered from the standpoint of the amateur and private owner. Among the apples recommended are: Charlamowski, Cludius Herbstapfel, Manks Codlin, Cellini, Bismark Ananas-Reinette, Lora Suffield and Lord Grosvenor. Among the pears, Esperens Herrenbirne, Williams Christbirne, Mme. Treyve, Neue Poiteau, Clairgeau, Birne von Tongre, Le Lectier and, as a late variety for planting in protected places, Olivier de Serres, are recommended.—*J. C. Th. Uphof.*

688. Schipper. **Warum wird der Anbau von Aprikosen vernachlässigt?** [Why is apricot growing neglected?] Gartenwelt 28: 84–85. *1 fig.* 1924.—Apricot growing has been much neglected in Germany, although there is demand for the fresh and preserved fruit. Like peaches they are less susceptible to frost when planted on warm sandy and limy soils than when grown in fertile garden soil. Twigs must be well ripened before winter starts. When grown on espaliers against walls, the fruit become mealy but have a stronger aroma. Apricots may be planted as bush trees, half or ordinary standard. The best varieties for Germany are Ambrosia, Nancy and Breda.—*J. C. Th. Uphof.*

689. Schubert, Edm. **Spinat "Juliana."** [The spinach, "Juliana."] Möllers Deutsch. Gärtnerzeitg. 40: 243. *2 fig.* 1925.—For raising seed of this variety the author does not need male plants, as the Juliana produces male as well as female flowers on the same plant; this he considers as an improvement. Pure male plants are "the weeds of the spinach" and are not necessary with this variety.—*J. C. Th. Uphof.*

690. Schuster, C. E. **Pollination and growing of the cherry.** Oregon Agric. Exp. Sta. Bull. 212. *1–40. 14 fig.* 1925.—In pollination work on the cherry, emasculating the flowers and leaving them exposed to the open air is preferred to sacking the flowers. Pollen was taken from a flower by rubbing it over a piece of window screen. Prompt pollination, as soon as the flowers are receptive, gives best results. Bing, Lambert, and Napoleon are self-sterile and inter-sterile. Intersterility is common among sweet cherries. In general, pollenizers for sweet cherries can not be recommended by varietal name. It is necessary to designate specific trees or groups of trees of proved worth. Performance in the field is a good check as to the value of pollenizers. Sour cherries are not satisfactory for pollination of sweet cherries. One tree in 9 is the proportion of pollenizers necessary. Using whole trees as pollenziers is usually preferable to using one limb in each tree. One hive of bees should be used to 1 or 2 acres of trees.—Sweet cherries should be planted 30–40 feet apart; sour cherries, 25–30. Mazzard seedlings should be used for the trunk and scaffold branches where gummosis is destructive. Trees should be pruned from the beginning, with but little heading done after the 1st few years.—*From author's summary.*

691. Schwerin, Fritz von. **Farbig belaubte Dahlien.** [Variegated dahlias.] Gartenwelt 28: 296–297. 1924.—Lucifer has serrate, deep blood-red leaves. Deutsche Sieg is probably a sport of Lucifer, as the foliage is the same, though the flowers of the latter are golden yellow. Doktor Mellinghoff is the only variegated variety. The writer mentions the variety Goldfasan, plants of which started in spring with yellow-spotted leaves like those of an Aucuba. A number of cuttings were made, which were all variegated. About the end of April the leaves of the mother plants and cuttings changed gradually into pure green within 14 days. No change recurred the following spring.—*J. C. Th. Uphof.*

692. Sears, F. C. **Certifying nursery fruit trees true to name.** Gard. Chron. [London] Ser. III. 77: 169–170. 1925.—A method has been developed at the Massachusetts Agricultural College by J. K. Shaw, for identifying apple varieties by the foliage.—*P. L. Ricker.*

693. Sears, F. C. **The varieties I should choose if I were planting 1,000 apple trees.** Ann. Rept. Massachusetts Fruit Growers' Assoc. **31**: 39–46. 1924.

694. Shaw, J. K. **Certification of nursery stock.** Ann. Rept. Massachusetts Fruit Growers' Assoc. **31**: 34–38. 1925.—The work of 1924 on certifying varieties of nursery apple trees as true to name, is reported. The number of trees certified to be true to name, approximately 126,000, shows considerable increase over the number certified the previous year. The number of trees refused certification as not true to name was 3,505. Plum and pear varieties may be certified next year. The total cost to the nurseryman is approximately 2 cents per tree.—*J. K. Shaw.*

695. Shaw, J. K. **Cultivation vs. sod and nitrate in the apple orchard.** Ann. Rept. Massachusetts Fruit Growers' Assoc. **13**: 54–71. 1925.—An apple orchard planted to Baldwin, McIntosh, Oldenburg and Wealthy was divided into 7 plots, 3 of which were seeded to a grass mixture and maintained on the grass mulch system with 300 pounds of nitrate of soda per acre annually, while 4 were maintained in cultivation with no fertilizer. In a 4-year test the sod-nitrate plots gave better shoot growth, a better set of fruit, somewhat larger apples and a larger yield.—*J. K. Shaw.*

696. Smith, Edith Philip. **The germination of Garcinia ovulifolia. Oliv.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 15–16. *7 fig.* 1924.—The seed collected in Nigeria were germinated at Edinburgh. The primary root emerges first and reaches a length of 21 mm. before any signs of the emergence of plumule can be seen. When the plumule is 10 mm. long an adventitious root appears at the 1st node. At a later stage the primary root shrivels and dies and the adventitious root becomes the functional main root.—*Thomas Swarbrick.*

697. Smith, J. Lee. **Safeguarding Satsumas from damage by cold waves.** Florida Grower **32**[11]: 7. 1925.—The damage done to the trees during the cold wave of 1924 was on the exposed body of the tree. Up to the spring of 1924 it was the practice of the west Florida Satsuma grower to cease cultivation by July 15, believing his trees would "harden up," in which condition they would better withstand the cold. Observations made before and after the cold wave have convinced the author that trees under these conditions suffered. Summer cover crops should be put in early in May and taken off the last of September or beginning of October. The danger period from cold does not begin until the last few days of December. Trees cared for in this way will go dormant by November 15, after making their regular full fall growth. Such trees will be likely to escape any late spring cold.—*J. C. Th. Uphof.*

698. Smith, William Wright. **On Primula Paulina.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 8–9. *Pl. 1.* 1924.—A description of this new Chinese Primula and a photograph are given. It flowered at the Royal Botanic Garden, Edinburgh, in July and August, 1923. It is a striking species of the Geranioides and apparently the only yellow-flowered member of that series. The very elongate, lax, racemose inflorescence is also a mark for its ready recognition.—*Thomas Swarbrick.*

699. Stahel, Gerold. **Het verschepen van Sinaasappels uit Suriname. [Shipping oranges from Surinam.]** Dept. Landb. Nijverheid en Handel Suriname Bull. 50. *1–24.* 1925.—Orange growing has extended considerably since 1923 and much attention is paid to budded plants. Orange growing is advantageous for the small farmer. On 5 trips by ocean steamers, 1475 boxes have been exported.—*J. C. Th. Uphof.*

700. Stewart, L. B. **The budding of Acer.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 43–44. *Pl. 5.* 1924.—The following varieties which do not come true from seed have been dealt with by a process of budding: *Acer campestre pendulum foliis variegatis; Acer dasycarpum foliis albo-variegatis; Acer Pseudo-Platanus flavo-marginatum* (Corstophine Plane). Budding is done from the end of July until late September. The knife edge must not penetrate through the cambium layer; if it does poor results are obtained.—*Thomas Swarbrick.*

701. Stokes, W. E. **Lawns in Florida.** Florida Grower **32**[3]: 28. 1925.—The best plants for lawn purposes in Florida are Bermuda and St. Augustine grass. They make sod quickly, grow well in the shade and remain green practically the entire year.—*J. C. Th. Uphof.*

702. Sturm, H. **Zur Kultur von Primula malacoides. [Growing Primula malacoides.]** Möllers Deutsch. Gartnerzeitg. **40**: 229–230. 1925.—When sown in June, *P. malacoides* flowers in spring; when sown in October it flowers the succeeding summer, but less profusely. Plants may be kept in frames during winter and withstand some frost.—*J. C. Th. Uphof.*

703. Swingle, Walter T., T. Ralph Robinson, and Eugene May, Jr. **Quarantine procedure to safeguard the introduction of citrus plants: A system of aseptic plant propagation.** U. S. Dept. Agric. Dept. Circ. 299. *1–15. Fig. 1–13.* 1924.—This paper treats in detail some of the precautions considered important in handling imported citrus plants to guard against introducing dangerous new pests and diseases. Matters considered include: protection by fumigation and spraying, and through special devices for the exclusion of insects; propagation and regeneration through the double transfer of buds; release from quarantine, and regulations. In dealing with imported plants, modern horticulture must recognize aseptic propagation.—*L. R. Hesler.*

704. Swingle, Walter T., T. Ralph Robinson, and Eugene May, Jr. **The solar propagating frame for rooting citrus and other subtropical plants.** U. S. Dept. Agric. Dept. Circ. 310. *1–13. Fig. 1–6.* 1924.—The solar rooting frame is best suited to warmer sections of the country having a relatively large proportion of sunshine.—*L. R. Hesler.*

705. Taylor, R. H., and G. L. Philp. **The almond in California.** California Agric. Exp. Sta. Circ. 284. *1–57.* 1925.—This circular is a revision, by the junior author, of California Agric. Exp. Sta. Bull. 297, by R. H. Taylor.—*A. R. C. Haas.*

706. Vanderryst, A. **Contributions à l'étude du Palmier à l'huile au Congo Belge. 8. Le vin de palme ou malafu.** [**Contributions to the study of the oil palm in the Belgian Congo. 8. Palm wine or malafu.**] Bull. Agric. Congo-Belge **11**: 219–224. 1920.—The natives of the Belgian Congo gather the sap of *Elaeis* in 4 ways: (1) By cutting the peduncles of the male inflorescences; (2) by making an incision in the trunk at the base of a male inflorescence, (3) at the base of a leaf; (4) by cutting a tree and removing the terminal bud. The wine works by ferments contained in the uncleaned gourds which are used in gathering. The fresh sap contains but little alcohol. When fermentation is complete the alcohol content may be 4–5½%. The total acidity is 4 gr. to the liter. Palm wine slightly fermented is a healthful and nourishing drink the harvest of which should be standardized.—*P. van Oye (translated).*

707. Ward, F. Kingdon. **Rhododendrons.** Gard. Chron. [London] Ser. III. **75**: 222, 240, 256–257, 306, 338, 358–359; **76**: 12, 24–25, 46, 62–63, 116, 124–125, 199, 236, 253, 264, 286, 304, 320–321, 332, 356. 1924.—Garden Rhododendrons are considered from the standpoints o hardiness, climate and economy.—*P. L. Ricker.*

708. Wehrhahn. **Primelnhybriden.** [**Primula hybrids.**] Gartenwelt **28**: 342–343. *2 fig.* 1924.—In recent years a number of ornamental primulas have been introduced from western Central China. A number of garden hybrids derived from these species are described.—*J. C. Th. Uphof.*

709. Wehrhahn, H. R. **Sisyrinchium striatum Sm.** Gartenwelt **28**: 47. 1924.—*Sisyrinchium striatum* proved to be winter hardy in Proskau, Germany. The writer recommends improving and breeding different species for ornamental purposes.—*J. C. Th. Uphof.*

710. Winkler, A. J., and H. E. Jacob. **The utilization of sulfur dioxide in the marketing of grapes.** Hilgardia **1**: 107–131. *Fig. 1–4.* 1925.—In preliminary tests with boric acid, formic acid, formaldehyde, benzoate of soda, salicylic acid, and SO_2, in the preservation of fresh grapes, the last named was the only substance which showed any favorable results, and additional experiments were restricted to it. The SO_2 in suitable concentration prevents the loss of sugar and the accumulation of alcohol, decreases the rate of respiration, and prevents the growth of microörganisms. It was applied as a gas in air, as a water solution of the gas, or as a water solution of potassium or sodium metabisulphite. With sealed containers and a concentration of SO_2 of about 600 mgm. per kilo of grapes, the fruit kept without spoilage for from 4–6 months, and with higher concentrations, almost indefinitely. Fruit so preserved, however, is suitable only for manufacturing purposes, and further experiments were carried on to determine whether the gas might be used to retard spoilage in table grapes also. It was found that 50 mgm. of SO_2 absorbed per kilo of grapes was sufficient approximately to double the keeping period, and that a concentration as high as 100 mgm. does not injure the color, texture, or flavor. Results obtained from an experimental carlot shipment indicate that this treatment can be commercially practicable.—*Margaret Buvens.*

711. Zeller, T. Kakao. [Cocoa.] **Monographien zur Landwirtschaft warmer Länder. [Monographs on agriculture of warm countries.] Vol. I.** *165 p. 4 fig.* Walter Bungert:

Hamburg, 1925.—This is the 1st of a number of volumes on tropical agriculture. Various races and varieties of the cocoa plant are enumerated. Discussions include breeding, climate and soil, reproduction, distances of planting, protection against sun and wind, drainage and irrigation, pruning, harvesting, and fertilizing. A special chapter is devoted to diseases and pests. Fermentation and drying of the beans, physical and chemical characteristics of the seed, production and use in different countries, are discussed. A bibliography of 34 titles is appended.—*J. C. Th. Uphof.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

A. J. Eames, *Editor*

(See also in this issue Entries 34, 50, 92, 106, 125, 142, 307, 315, 342, 378, 381, 442, 585, 646, 664, 676, 774, 831, 940, 953, 1047, 1142)

712. [Baranov, P. A.] Баранов, П. А. **Материалы к анатомии горных растений. II. Опыт сравнительно-анатомической характ ери стики горных ксерофитов и мезофитов.** [Materials for the anatomy of alpine plants. II. A paper on the comparative anatomical structure of alpine xerophytes and mesophytes.] Бюллетень Средне-Азиатского Государ ст венного Университета. [Bull. Central Asiatic State Univ.] 8. *57–66.* 1925.—The principal difference in anatomical structure of alpine mesophytes and xerophytes is the more vigorous development of the palisade parenchyma in xerophytes. The isolateral palisade type of leaf structure is typical of xerophytes, in distinction from mesophytes where the dorsiventral type prevails. The predominance of the stomata on the upper side of the leaf is also an essential feature of alpine xerophytes. In the mesophytes the greater number of stomata is to be found on the lower side of the leaf. The thickness of the leaf is greater in xerophytes than in mesophytes. Stomata sunken below the level of the epidermis are met with in xerophytes as an exception; in the majority of xerophytes and mesophytes the stomata are level with the epidermis. The outer wall of the epidermal cells is, according to the author's observations, thicker in xerophytes than in mesophytes.—*Dorochenko.*

713. Bonne, G. **Sur la présence de liber interne chez quelques Rosacées.** [The presence of internal phloem in certain Rosaceae.] Compt. Rend. Acad. Sci. Paris 180: 687–690. 1925.—Juel's transfer of *Sorbaria* and *Chamaebatiaria* to the tribe Gilleniae is substantiated by another method of attack. *Pyrus Malus* and *Exochorda grandiflora* also have internal phloem.—*C. H. Farr.*

714. Bouygues, H. **Les fascies axillo-cotylédonaires du Haricot de Soissons.** [The axillo-cotyledonary bundles of the Soissons bean.] Compt. Rend. Acad. Sci. Paris 180: 1678–1680. 1925.—These structures can be experimentally obtained in some legumes, but not in others. This is a preliminary account of their location.—*C. H. Farr.*

715. Bugnon, P. **Homologies foliaires chez la Violette odorante: Feuilles végétatives, préfeuilles et bractées.** [Foliar homologies in the sweet-scented violet: Vegetative leaves, preleaves, and bracts.] Compt. Rend. Acad. Sci. Paris 180: 682–684. 1925.—A study of the morphology, anatomy, ontogeny, and teratology of the leaves of the violet. It is concluded that in the violet, vegetative leaves, preleaves and bracts are homologous organs.—*C. H. Farr.*

716. Bugnon, P. **Homologies foliaires chez la Violette odorante: Sepales et petales.** [Foliar homologies in the sweet-scented violet: Sepals and petals.] Compt. Rend. Acad. Sci. Paris 180: 1042–1044. 1925.—The sepals of the sweet-scented violet are hypophyllodes, the petals are protophyllodes, and the spur is homologous with the petiole of the vegetative leaf.—*C. H. Farr.*

717. Bugnon, P. **Homologies foliaires chez la Violette odorante: Étamines et carpelles.** [Foliar homologies of the sweet-scented violet: Stamens and carpels.] Compt. Rend. Acad. Sci. Paris 180: 1174–1176. *Fig. 1–4.* 1925.—The stamens of the violet are homologous with the petals. It appears simplest and best to interpret the pistil as a single carpellary leaf closed medianly and anteriorly.—*C. H. Farr.*

718. Giesenhagen, K. **Die Gestaltung des Wedels von Pteris ensiformis Burm.** [The form of the frond of Pteris ensiformis.] Flora 118–119: 127–149. *9 fig.* 1925.—The great

variation in the form of the frond of *P. ensiformis* is due to the fact that there are 4 distinct autonomous processes of growth, each of which is influenced by combinations of external and internal factors. The processes are: (1) The formation of the primordium at the tip of the rhizome; (2) the intercalary growth in length of the stipe and the pinnae; (3) the apical growth of the unbranched end lobes; (4) the marginal growth of the lamina. The fronds of *P. ensiformis* are usually described as dimorphic but they are not typically so in their development.—*A. G. Stokey.*

719. Guèrin, Paul. **L'anthère des Gentianacées. Développement du sac pollinique. [The anthers of the Gentianaceae. The development of the pollen sac.]** Compt. Rend. Acad. Sci. Paris **180**: 852–854. *Fig. 1–2.* 1925.—In *Gentiana* and *Swertia* there is an extensive sterile tissue instead of a nourishing layer. In *Chlora, Erythraea, Cicendia, Menyanthes,* and *Limnanthemum,* however, the ordinary nourishing layer is formed. The 2 last-named are distinguished from the other 3 in the arrangement of their pollen mother-cells; they are also the aquatic genera.—*C. H. Farr.*

720. Guèrin, Paul. **Le dévéloppement de l'anthère et du pollen chez les Gentianées. [Development of the anther and pollen in gentians.]** Compt. Rend. Acad. Sci. Paris **179**: 1620–1622. *Fig. 1–2.* 1924.—In most flowering plants there is a nourishing layer in the anther but in the gentians there is a sterile tissue. *Gentiana germanica* has few pollen mother cells. *G. lutea* has many. Seven other species are also studied.—*C. H. Farr.*

721. Hamet, Raymond. **Sur les formations cribro-vasculaires médullaires de deux Crassulacées. [The medullary phloem formation of two Crassulaceae.]** Compt. Rend. Acad. Sci. Paris **180**: 1424–1425. 1925.—The structures of *Echeveria gibbiflora* and *Greenovia terrae* are described.—*C. H. Farr.*

722. Henderson, Elizabeth M. **The stem structure of Sargentodoxa cuneata, Redt et Wils.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 57–62. *1 fig.* 1924.—*Sargentodoxa cuneata* is a twining plant belonging to the family Lardizabalaceae and is a native of Central China and Indo-China. The internodal anatomy shows a well marked endodermis with suberised walls. On the inner side of this endodermis is an unbroken ring of fibers on the inner side of which is a narrow layer of thin-walled cells in which the cork cambium develops. The periderm makes its appearance when the stem is 4–5 months old. At the 11th and 12th internodes from the growing tip the starch is confined to the endodermis, and at the 15th internode the starch has gone from the endodermis, the latter at this level being fully suberised. The leaves alternate in 2 rows. Ten of the 12 strands in the stem are referable to leaf traces, the other 2 are associated with the development of the bud in the leaf axil. A general comparison of *S. cuneata* with other Lardizabalaceae is given.—*Thomas Swarbrick.*

723. Jean, Maurice. **Sur la nature du liber interne de la plantule de Convolvulus tricolor. [The nature of the internal phloem of the seedling of Convolvulus tricolor.]** Compt. Rend. Acad. Sci. Paris **180**: 1860–1862. *Fig. 1–5.* 1925.—In the young seedling there are a number of cells which divide only by tangential partitions giving rise to parenchyma which behaves as a true cambium forming internal phloem. This parenchyma is distinct from the pith.—*C. H. Farr.*

724. Kean, Christina J. **The morphology and physiology of the leaves of some Grassulaceae.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 96–104. *4 fig.* 1924.—The species here dealt with are *Rochea falcata* D.C., *R. coccinea* D.C., *Grassula arborescens* Willd., *Bryophyllum crenatum* Baker, and *Sempervivum triste* Baker. In *Rochea falcata* the whole surface of the leaf is covered with transparent bladder hairs fitting so close together as to form a complete covering. The outer walls of these cells are slightly cutinised. The leaf structure is almost centric. The leaf trace consists of 3 vascular bundles coming off independently from the stem stele. There is an average of 3–7 hydathodes per field of view (2.27 sq. mm.), and these are usually closely associated with the stomata. Evidence is put forward in support of the suggestion that the water given off at the hydathodes is absorbed by the bladder hairs. In *Grassula arborescens* the distribution of tissues in the leaf is very much like that in *Rochea falcata* but there are no bladder hairs, the leaf having a complete covering of wax. Hydathodes are abundant on the upper surface of the leaf and are more numerous towards the margins. On the under surface there are 2 submarginal rows of hydathodes. In *Bryophyl-*

lum the vascular tissue anastomoses much more than in the 2 plants noted above; each hydathode has 3 systems of tracheids passing to its base. The rich vascular supply to the edges of the leaf of *Bryophyllum* may have some connection with the prolific development of vegetative buds so characteristic of the species. In *Sempervivum triste* there are no hydathodes and the stomata are equally distributed over both surfaces. This indicates a stronger transpiration current for this species than for any other examined in this study.—*Thomas Swarbrick.*

725. Knagg, M. M. B. **The leaf structure of Begonia fuchsioides, Hook.** Trans. & Proc. Bot. Soc. Edinburgh 29[1]: 63–65. *2 fig.* 1924.—The stomata are situated in the lighter green patches on the under side of the leaves. The chlorophyll tissue forms a narrow band running in the center of the leaf and is surrounded by an envelop of water cells. The epidermis is essentially similar on both surfaces, and no cuticle is present. This lack of cuticle in a partial xerophyte is extraordinary.—*Thomas Swarbrick.*

726. [Kobranov, N. P.] Кобранов, Н. П. **О многосемянных желудях у черешчатого дуба Quercus pedunculata Ehrh. и всходах из них получающихся.** [Polyspermous acorns of Quercus pedunculata and seedlings obtained from them.] Вестник Опытного Дела. [Jour. Experimental Work.] 5–6: 80–107. *5 fig.* 1921.—In the acorn of *Quercus pedunculata* there may develop as many as 6 seed, though actually a maximum of 4 seed (with 8 cotyledons) has been observed. Most frequently, 2-seeded acorns are met with, the 4-seeded ones being more rare. The formation of polyspermous acorns is peculiar to individual trees, where the number of many-seeded fruits may be as great as 40%. According to the method of origin of the polyspermous acorns, there may be established 3 types: (1) The usual type of development—each seed originates from a separate ovule, a dividing septum being observed in the plane where the seed come into contact; (2) polyembryonal type—the seed develop from 1 ovule, the dividing septum being absent; (3) part of the seed develop in the usual way, the others, polyembryonally.—*E. Sinskaja.*

727. [Kuz'mina, L. V.] Кузьмина, Л. В. **Материалы к анатомии горных растений. I. Лист горных мезофитов.** [Contributions to the anatomy of alpine plants. I. The leaf of alpine mesophytes.] Бюллетень Средне-Азиатского Государственного Университета. [Bull. Central Asiatic State Univ.] 8. *1–40.* 1925.—The leaves of alpine plants of Turkestan were investigated anatomically. The data given in the present paper refer to mesophytes only. Having studied about 40 species the author comes to the following conclusions: The leaves of the alpine mesophytes are thin and so are the outer walls of the epidermis. The stomata, which are level with the epidermis, are scattered over both surfaces of the leaf, being more numerous on the lower surface. The palisade tissue makes up ⅓ of the thickness of the leaf. The dorsiventral type of leaf is predominant.—*Dorochenko.*

728. Lavialle, P. **Sur le sac embryonnaire des Dipsacées.** [The embryo sac in the Dipsacaceae.] Compt. Rend. Acad. Sci. Paris 180: 1127–1129. 1925.—A reinvestigation of the antipodal condition in *Knautia arvensis* was made. The nucellus is completely resorbed during development and the inner layer of the integument proliferates, giving rise to cells which surround the antipodals.—*C. H. Farr.*

729. Lavialle, P. **Sur les antipodes et la région chalazienne de l'ovule des Dipsacées.** [The antipodals and the chalazal region of the ovule in the Dipsacaceae.] Compt. Rend. Acad. Sci. Paris 180: 1606–1608. 1925.—This is a continuation of the previous paper (see preceding Entry) on *Knautia arvensis.* The ovule and the embryo sac are figured.—*C. H. Farr.*

730. Lavialle, P. **Sur la nutrition du sac embryonnaire chez Knautia arvensis Coult.** [Nutrition of the embryo sac of Knautia arvensis.] Compt. Rend. Acad. Sci. Paris 180: 2055–2056. 1925.—A study, with microchemical tests, is made of the antipodals, the chalazal cells of the ovule, the periantipodal tissue and the plastids in the equator of the embryo sac.—*C. H. Farr.*

731. [Levitskii, G. A., and N. E. Kuz'mina.] Левитский, Г. А. и Н. Е. Кузьмина. **К вопросу о причинах наследственных отличий в величине клеток по наблюдениям над свеклой.** [Contributions to the question of the causes of the hereditary differences in the size of cells, based on observations on beets.] Бюллетень Сортоводно-Семенного Управления Сахаротреста. [Bull. Variety and Seed Selection Div. Sugar Trust (Russia).]

6. *84–93.* 1923.—The authors' purpose in investigating large-celled and small-celled races of beets was to ascertain whether the difference in the size of the cells depends on a primary difference, showing itself already in the meristematic tissue of the respective races, or whether it is the result of a subsequent unequal growth of the cells. The subjects of investigation were sugar beets and forage beets, forms extreme in regard to the size of their cells. Measurements were taken of the cells of a fully developed leaf, as well as of the meristem cells of the growing point of the stem. Of such measurements, 42–75 were carried out for each race. On the basis of the large amount of material obtained, the author comes to the conclusion that the size of the meristem cells in both investigated varieties (sugar beet and forage beet) is the same. The difference in the dimensions of the mesophyll cells is evidently determined by the difference in the subsequent growth of the cells, which is more vigorous in the forage beet than in the sugar beet. The author holds that the large-celled and small-celled races of beets bear the same relations to one another as different specimens of the same race which have grown in a moist and in a dry habitat, and that the difference in the size of the cells is a peculiarity of secondary nature. The author sees a possible reason for the smaller size of the cells of the sugar beet in the greater thickness of the cell membrane, which in its turn may be controlled by an abundance of assimilants in the leaf.—*Dorochenko.*

732. Mitchell, Margaret R. **Note on the lateral lines of the petioles of ferns.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 105–112. *5 fig.* 1924.—The lateral lines found on some fern petioles contain stomata, and stomata are absent from the rest of the petiole. This investigation deals particularly with the lateral lines of *Pteris aquilina* L., *P. tremula* R. Br., *P. cristata* Moore., and *P. macilenta* A. Rich.; and generally with those of *Aspidium aculeatum* Sw., *Dictymia attentuata* Sm., *Polypodium vulgare* Linn., *Scolopendrium vulgare* Sm., *Polypodium serpens* Sw., *Lomaria Spicant* Desv., *Todea hymenophylloides* A. Rich., and *Hymenophyllum* sp. It is concluded that these strips of stomata on the petioles of ferns, as well as the flanges found in some species, and the subjacent tissues appear to be vestigial remains of side wings such as Bower describes.—*Thomas Swarbrick.*

733. Netolitzky. **Über das Ovulum der Pflanzen.** [**The ovule.**] Bul. Ştiinţe Nat. **26**[6]: 129–136. (Publicaţiile Societăţii Naturaliştilor din România Nr. 6) 1923.—After a critical comparison of the studies of Warming and others in this field, the author gives the following summary and conclusion: The most primitive ovule of the angiosperms (that is, neither reduced nor derived in type) is as follows: (1) Anatropous, with thick nucellus, with two 2(-3)-layered integuments which are distinct up to the always small chalaza. Both integuments partake in the formation of the micropyle. (2) The 3 protective layers of the 2 integuments and the nucellus persist until the seed becomes mature, and the cells of the integuments form the ripe seed coats without increase or loss. (3) The innermost layer of the outer integument becomes a crystal-bearing layer. (4) The vascular bundle of the raphe ends at the chalaza without sending branches into the outer integument.—*Al. Borza* (*transl. by A. J. Eames*).

734. Orr, M. Y. **Abnormal fruits of Erysimum Czetzianum, Schur.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 10–14. *2 fig.* 1924.—A detailed description is given of a remarkable case of proliferation resulting in the production of a miniature flower within the fruit of a crucifer. This is of extreme interest to tetratologists. Each internal flower was more or less a miniature replica of the larger flower of which it formed an aberrant part. The petals were lemon color, as in the species, and mature pollen grains were found in the anthers. The ovary contained ovules in no way different from those of a normal flower. Anatomical study of the 2 halves of the replum leads to the conclusion that the morphologically radial region of the replum from which these intra-carpellary flowers of *Erysimum* arise really represents a proliferation of the parent axis. Similar cases of proliferation are cited as occurring in those plants with free central placentation.—*Thomas Swarbrick.*

735. Römer, I. **Beiträge zur Morphologie und Anatomie von Astragalus Römeri Simk.** [**Contributions to the morphology and anatomy of Astragalus Römeri Simk.**] Verhandl. u. Mitteil. Siebenbürgischen Ver. Naturwiss. **72–74**: 12–16. *4 fig.* 1922–1924 [1924].—A description, with figures, is given of the germination of the seed of *Astragalus Römeri*, of the development of the first 7 leaves, and of the trichomes. This endemic plant of the rocky

Piatra rosie (Vereskö) from Tulghes in Rumania can be easily cultivated.—*Al. Borza (translated).*

736. Sahni, B. **On Tmesipteris Vieillardi, Dangeard, an erect terrestrial species from New Caledonia.** Phil. Trans. Roy. Soc. London B. **213**: 143–170. *2 pl., 7 fig.* 1925.—Two species of *Tmesipteris* are recognized: *T. Vieillardi* Dang., and *T. tannensis* Bernh. including provisionally the forms *lanceolata* and *elongata*. *T. Vieillardi* differs from *T. tannensis* in its erect terrestrial habit and narrow strap-shaped leaves with parallel margins, the presence of cauline medullary xylem in the lower part of the aerial shoot, and in the structure of the pith and sieve-tubes. Its erect habit, terrestrial habitat and medullary xylem mark it as an archaic form of the genus, facilitating the comparison of the Psilotaceae with the Psilophytales. In the aerial shoot of *Tmesipteris* the phloem is not confined to a layer outside the xylem ring but more or less completely surrounds each individual bundle of the ring. In longitudinal sections of *T. Vieillardi* and the varieties of *T. tannensis* the histological distinction between the pith and the phloem abutting on it is clear when stained with Gentian Violet and Orange G.—*W. R. G. Atkins.*

737. Schönberg, F. **Die Zweig- und Astsysteme bei den Obstbäumen und Obststräucher. [The twig and branch system of fruit-bearing trees and shrubs.]** Möllers Deutsch. Gärtnerzeitg. **40**: 249–252. *20 fig.* 1925.—A study is presented of the branch systems of different kinds of fruit trees and shrubs at various ages.—*J. C. Th. Uphof.*

738. Smith, Edith Philip. **The anatomy and propagation of Clematis.** Trans. & Proc. Bot. Soc. Edinburgh **29**[1]: 17–26. *Pl. 2–3, 6 fig.* 1924.—There are no "cauline" bundles, the whole vascular supply being derived from leaf traces. The phyllotaxis is opposite and decussate and at each node 2 leaf traces enter the stem. The leaf trace bundles are really triple but they fuse completely just before entering the stem.—The starch sheath is differentiated as a definite layer at a very short distance behind the growing point, and breaks down at the nodes. The 1st cork cambium appears in the pericycle and forms a complete ring cork.—Under ordinary conditions cuttings of *Clematis* will not root at the node. Accordingly internodal cuttings of the current season's growth were propagated in cocoanut fiber at 65–70°F. The 1st indication of callus formation began in the cortex opposite the medullary rays. The roots always originated in the cambium of the stem. By etiolating the stem apex while still in contact with the rest of the plant, rooting took place readily at the nodes; etiolation also considerably lessened the time taken for roots to appear. After prolonged etiolation of the growing tip of a specimen of *Clematis Forestii*, the starch sheath was still evident but no sign of a Casparian strip was detected; from this it is concluded that the starch sheath cannot be considered as truly equivalent to an endodermis. The production of callus roots is regeneration, and appears to depend upon a certain ratio of carbohydrate to amino radicles. If by any means the required C:N ratio can be restored, a mature tissue can be incited to regeneration. Etiolation while the part is still in full communication with the vascular supply has been shown to act in this way. The structure of the node of *Clematis* shows considerable sclerenchyma and very little cambium, hence it presents no difficulties to rooting. The etiolation acts by softening the tissues, and by inciting meristem activity. The practical application of this work is important and may simplify the propagation of some stubborn forms.—*Thomas Swarbrick.*

739. Souèges, René. **Embryogénie des Hypericacées. Développement de l'embryon chez l'Hypericum perforatum L. [Embryogeny of the Hypericaceae. Development of the embryo of Hypericum perforatum.]** Compt. Rend. Acad. Sci. Paris **180**: 949–951. *Fig. 1–36.* 1925.—In the disposition of the 1st blastomeres, *Hypericum perforatum* offers analogies to flax, which also possesses a filamentous proembryo. In later stages it is similar to the embryo of shepherd's purse.—*C. H. Farr.*

740. Souèges, René. **Embryogénie des Lythracées. Développement de l'embryon chez le Lythrum Salicaria L. [Embryogeny of the Lythraceae. Development of the embryo of Lythrum Salicaria.]** Compt. Rend. Acad. Sci. Paris **180**: 1417–1418. *Fig. 1–17.* 1925.—The development of the embryo of this plant more closely resembles that of *Oenothera biennis* than that of any other plant thus far studied.—*C. H. Farr.*

741. Souèges, René. **Embryogénie des Rutacées. Développement de l'embryon chez**

le Ruta graveolens L. [Embryogeny of the Rutaceae. Development of the embryo of Ruta graveolens.] Compt. Rend. Acad. Sci. Paris 180: 1957–1959. *Fig. 1–30.* 1925.—The embryogeny of *Ruta* resembles that of the Ranunculaceae.—*C. H. Farr.*

742. Stewart, L. B. **Remarks on the morphology and propagation of Gardenia sp.** Trans. & Proc. Bot. Soc. Edinburgh 29[1]: 41–42. *Pl. 4.* 1924.—In *Gardenia* it is very seldom that an axillary bud develops except when the main shoot is damaged or cut off. If the leader be cut off the buds in the leaf axils all develop. The growth form of cuttings taken from the perpendicular leader is somewhat different from that of the mature undamaged plant. Instead of making perpendicular growth, squat branch growth occurs, making more and larger leaves than normally. Such a cutting does not develop spines, a factor which gives it the appearance of being a different plant. Another peculiarity is that plants established from perpendicular shoots make no attempt to flower (20 years), whereas plants established from side-branch cuttings flower regularly every year. After a few years' growth the branch-shoot plant sends up a sucker (from a root) which assumes the normal upright form and unless cut out soon kills off the dwarf-branch-growth plant. In the Royal Botanic Garden at Edinburgh a development of the upright-stem form from the squat-branch form has never been seen.—*Thomas Swarbrick.*

743. Tronchet, A. **La polycotylie et la schizocotylie dans le Dimorphotheca pluvialis Moench.** [Polycotyly and schizocotyly in Dimorphotheca pluvialis.] Compt. Rend. Acad. Sci. Paris 180: 1862–1864. 1925.—The author substantiates Hill and de Fraine in their term "demi-cotyledon," and distinguishes, contrary to Compton, between polycotyly and schizocotyly.—*C. H. Farr.*

744. [Vysotskii, G.] Высоцкий, Г. **О моноподиально корневищных травах.** [Monopodial-stoloniferous plants.] Труды по Прикл. Бот. и Селекции. [Bull. Appl. Bot. and Plantbreed.] 13[3]: 22–24. *2 fig.* 1923.—The author states that *Pteridium aquilinum, Carex colchica, Carex Schreberi* and *Agropyron ramosum* represent types of monopodial rhizomatous plants, and gives a short description of their underground parts.—*E. Sinskaja.*

745. Watanabe, Kiyohiko. **Über die Kontraktion und daraus verursachte Anomalie in der Wurzel von Cycas revoluta.** [Contraction in the root of Cycas revoluta and the anomalous structural condition caused thereby.] Japanese Jour. Bot. 2: 293–297. *Fig. 1–10.* 1925.—Contraction in the root occurs chiefly in the main root of seedlings, but occurs also in adventitious roots of cuttings. The contraction is restricted to the cortex which becomes transversely wrinkled by the collapse of plates of cortical cells. The earlier-formed vascular tissues are "bent." The bow-like plates of collapsing cortical parenchyma appear, when seen in transverse sections of the root, like cambium layers. The author suggests that these layers perhaps represent the "extra-fascicular cambium" reported in *Ceratozamia* and other cycads. Attention is called to their similarity to the sclerotic cortical plates of *Heterangium.* The cause of the contraction is the stretching and collapse of cortical cells under strong secondary vascular growth. Whether the subterranean position of the stems of cycads is attained through root contraction remains to be determined.—*A. J. Eames.*

746. Weese, J. **Zur Mikroskopie der Lupinenfasern.** [The microscopy of lupine fibers.] Mitteil. Techn. Mikrosk. Lab. Techn. Hochschule Wien 1. *3–16.* 1924.—The paper deals with the microscopy of the bast fibers of some species of lupine cultivated in Austria, since the works of T. F. Hanausek and R. Schwede concerning these fibers do not agree on important points. The idea of using lupines as fiber-supplying plants is not new. The fibers of *Lupinis albus* have been used for more than 100 years in southern countries for ropes and cordage and in the manufacture of paper. The literature contains records of such usage. The author studied not only the species of lupine examined by Hanausek, but also a number of other cultivated species, in order to clear up the apparent contradictions concerning the structure of the fibers.—*H. Cammerloher (translated by A. J. Eames).*

747. Withers, J. C. **Chemistry and technology of cotton cellulose.** [Rev. of: Hall, A. J. **Cotton-cellulose; its chemistry and technology.** *228 p.* Ernest Benn: London, 1924.] Nature 115: 757–758. 1925.—The book is regarded by the reviewer as somewhat premature, but is the best summary of the subject so far available.—*O. A. Stevens.*

748. Wylie, Robert B., and Alice E. Yocom. **The endosperm of Utricularia.** Univ.

Iowa Studies Nat. Hist. 10: 3–18. *Pl. 1–6.* 1922.—A study of *Utricularia vulgaris* var. *americana*, confirming Merz's account of the protruding female gametophyte and the unusual behavior of the endosperm reported by Kamienski, with certain additions and suggested interpretations. The nucellar tissue breaks down at the time the 3 outer megaspores disintegrate, and at the 2-celled stage the embryo-sac protrudes from the ovule. This emerging lobe at the micropylar end of the inverted ovule soon penetrates into a block of specialized nutritive cells organized by the placenta opposite each ovule. Such nutritive masses are specialized very early, and in conjunction with invading haustoria constitute the chief method of nutrition for the ovule and its contents. The egg apparatus remains attached to the funicular side of the sac within the ovule in its normal position. Pollen tubes meeting these protruding lobes of the female gametophyte outside of the ovule pass directly to the synergids. Both fertilization of the egg and the union of the 2nd sperm with the fused polars were observed.—Succeeding events are correlated with the peculiar organization of the ovary. Over 200 ovules cover the free central placenta and these in turn are tightly invested at all stages by the wall of the ovary. The ovules thus supported on all sides practically lose connection with the placenta. The funiculus develops no conductive tissue and at an early stage is reduced to a mere rudiment which seems functionless.—Following fertilization, 2 endosperm nuclei displace the feeble antipodals and dominate a haustorium which penetrates to the epidermis of the ovule and mushrooms against this layer. Another pair of free endosperm nuclei enters the micropylar haustorium, and these enlarge greatly as this growth penetrates into the nutritive tissue of the placenta. These prominent nuclei divide amitotically, and some of their fragments pass into the plasma within the placental cavity from which the tissue has been digested. The development of both endosperm and embryo is by means of nourishment thus derived directly from the placenta. This mode of nutrition is possible only for an inverted ovule held in position at all stages by the pressure of adjacent parts.—Recalling the unusual behavior of both female gametophyte and endosperm in this plant, the authors suggest that the relative uniformity of behavior of these phases of seed development in angiosperms in general is partly conditioned upon the relations of the parts concerned. The female gametophyte is so restricted in time, space, and nutritive relations as to be limited in its expression. Its fundamental functions on the other hand inhibit its reduction to egg-cell only. The unusual behavior when some of these factors are modified may be of significance.—*Robert B. Wylie.*

MORPHOLOGY AND TAXONOMY OF ALGAE

Wm. Randolph Taylor, *Editor*

(See also in this issue Entries 307, 331, 364, 399, 416, 418, 455, 460, 473, 1052, 1080, 1195, 1233)

749. Börgesen, F. **Note on the development of the young thallus of Cymopolia barbata (L.) Lamx.** Nuova Notarisia (Ser. 36) 40: 211–214. *2 fig.* 1925.—In the soft rock on which very young plants of *Cymopolia* were growing there were present enlarged, rhizome-like portions from which one or more upright shoots arose. The young stages of the upright part closely resemble those described for *Neomeris*. Several periods of growth are necessary for the production of a fully develop thallus.—*Wm. Randolph Taylor.*

750. Conger, Paul S. **A method for mounting strewn slides of microplankton.** Jour. Roy. Micros. Soc. 1925: 48. 1925.—Material preserved in formalin is washed, dehydrated, cleared in benzol, and mounted in a drop of warm styrax or piperine on a slide. The latter, with its high refractive index of 1.68, is especially suitable for diatoms.—*Wm. Randolph Taylor.*

751. Conger, Paul S. **A technique for type mounts of plankton diatoms and other microplankton.** Jour. Roy. Microsc. Soc. 1925: 43–47. *Fig. 1.* 1925.—The advantages of a series of type slides in the systematic study of diatoms is emphasized. Diatoms to be isolated by the mechanical finger are more readily withdrawn if spread and dried on a fine-grain, ground-glass slide rather than on a polished one. They are transferred to a cover smeared with prepared gelatin, dried and mounted in styrax or piperine.—*Wm. Randolph Taylor.*

752. Deflandre, Georges. **Additions à la flore algologique des environs de Paris. III. Flagellées. [Additions to the flora of the Paris District. III. Flagellates.]** Bull. Soc. Bot. France **71**: 1115–1130. *4 pl., 50 fig.* 1924.—The author follows in large part the order adopted by Lemmerman, being conservative in his determinations because of the fragmentary information generally available as to the possible variations and developemental stages of these organisms. Where necessary, certain species are followed from the standpoint of their geographical distribution, and the author has indicated the determining reasons. These are the species which have not been found again since their discovery. Emphasis is laid on the particular biological conditions of the stations. Several species are new to France.—*H. des Gayets (translated by J. M. Fogg, Jr.).*

753. Denis, M. **Revue des travaux parus sur les Algues de 1910 à 1920. [Review of the work on the algae appearing from 1910 to 1920.]** Rev. Gén. Bot. **37**: 34–48, 84–93, 131–144, 167–186. 1925.—This summary includes the development of systematic methods from the standpoint of ontogeny, experimental systematics and serodiagnostics; and the development of systems of classification based on morphology, development and systematic relationships. General biological features such as the physical and chemical states of the organism and its environment, geographical distribution including plankton studies in salt and fresh water and snow, aerial and rock algae, are given, together with a discussion of the utilization of marine algae. A considerable bibliography is included.—*Wm. Randolph Taylor.*

754. Fischer, R. **Die algen der Schwefelquelle zu Schüttborzitz in Mähren. [Algae of the sulphur springs at Schüttborzitz in Moravia.]** Verhandl. Naturf. Ver. Brünn **58**: (1–4). 1923.—The chemical composition of the water is given. The quantity of H_2S gas and of sulphates is high. On the water pipe from the spring and on the walls were patches of white Beggiatoas and brown-red *Porphyridium.* In the pool, *Stigeoclonium* appeared in the spring. Forming colonies, were *Oscillatoria amphibia* Ag., *O. formosa* Borg., *O. limosa* Ag., *O. tenuis* (Ag.,) Kirch., *O. tenuis* f. *sordida* Kg., *Phormidium fragile* (Menegh.) Gom., *Porphyridium cruentum* (Ag.,) Naeg., *Stigeoclonium tenue* Ag., with scattered filaments of *Lyngbya aestuarii* (Mert.) Liebm., *Oscillatoria limnetica* Lemm., and a considerable list of diatoms, mostly ubiquitous species, but ones more common as halophytes than otherwise.—*Wm. Randolph Taylor.*

755. Fischer, R. **Die Trentepohlia-Arten Mährens und West-Schlesiens. [Trentepohlia in Moravia and western Silesia.]** Oesterreich. Bot. Zeitschr. **71**: 1–30. *Pl. 1–2.* 1922. —Of the Trentepohliaceae, only *Phycopeltis epiphyton* Mill. is found in the territory considered in a free state, in addition to *Trentepohlia.* This latter genus is important because it is strictly aerial in habitat. The thallus is generally organized into a basal layer and upright abundantly branched filaments. The cell wall is lamellate, the outer part being frayed by rupture following growth of the cell. Cellulose and pectin are present. The chloroplast in the young cell is band-shaped, breaking up into disk-shaped fragments in older cells. Pyrenoids are absent, and there is but a single nucleus in each cell. The chlorophyll is obscured by a red-brown pigment, probably carotin. Vegetative reproduction is present in all species, and sporangia of 3 types: (1) Spherical sporangia formed from a vegetative cell; (2) stalked sporangia, borne on a 1-celled stalk; (3) funnel-sporangia, having the sporangium held in the open end of the subsporangial cell, this being perhaps only a form of the 2nd type. The last 2 types drop to the substratum and germinate to form zoospores; the 1st type produced facultative gametes. The group is considered a special offshoot of the Ulotrichales. For Moravia and western Silesia, *Trentepohlia arborum* and *T. lagenifera* are reported as new. A key to the species, especially complete synonyms, descriptions and geographical data, and a table of substrata and altitudinal distribution, are given.—*Wm. Randolph Taylor.*

756. Heimans, J. **De Desmidiaceenflora van de Oisterwijksche Vennen. [Desmid-flora of the marshes of Oisterwijk.]** Nederland. Kruidk. Arch. **1924**: 245–262. 1925.—A number of marshes occur near Oisterwijk (Netherlands) in which the number of Desmids is conspicuously variable. The differences between marshes remain constant over a period of several years. Probably differences in the "humic acids" cause the differences in floras. Hydrogen-ion concentration varies from pH 4 to pH 8, a considerable range for surface water. Some plant associations are very apparent: *Micrasterias oscitans* var. *mucronata* occurs with *Cosmarium*

Ralfsii, and *Staurastrum elongatum* occurs with *Docidium undulatum*. A list of the desmids in the various marshes is given.—*J. C. Th. Uphof.*

757. Huber-Pestalozzi, G. **Experimentelle Studien über Entwicklung und Formgestaltung bei Ceratium hirundinella. [Experimental studies on development in Ceratium hirundinella.]** Verhandl. Internat. Verein. Limnologie **1**: 15–19. 1923.—This is a summary of work published in an extended form elsewhere. Huber and Nepkow obtained *Ceratium hirundinella* in abundance as overwintering cysts in the lake at Zurich, at 100–140 m. depth. The older the cysts, the slower the germination; cysts 6½ years old were brought to germination, but not older ones. Freezing and drying killed the cysts. Young cysts required a resting period for germination, which occurred between 7 and 30°C. and produced first a Gymnodinium-like stage called by Huber and Nepkow, Gymnoceratium. This stage persisted about 2 hours at 18°C., after which followed the Praeceratium stage, during which the final morphological form and development of the wall plates was accomplished. The time of this stage is about 6 hours at 18°C., and is followed by the Ceratium stage where the division method of the species is characteristic. Researches on the cysts were made relative to the effects of various temperatures and lights, and of chemicals. The best temperature for normal development was between 15 and 23°C., beyond which range abnormalities were produced. A strong divergence from normal light and also violent shaking likewise produced abnormalities. The organism is very sensitive to divergences from the normal chemical content of the water, especially as to NaCl. The most favorable conditions for growth were a temperature of 15–23°C., in natural, slightly alkaline water. On the basis of these experiments answers may be offered to several important biological questions, especially the deficiencies in high alpine and arctic waters and in small pools which dry up, and in sea water.—*Author (translated by W. R. Taylor).*

758. Mann, Albert. **Marine diatoms of the Philippine Islands.** United States Nat. Mus., Smithsonian Inst. Bull. 100. Vol. 6[1]: 1–182. *39 pl.* 1925.—This report is based largely on collections made by the U. S. Bur. Fish. vessel, "Albatross." The area is of extreme richness, this being most unusual for a tropical locality. Plankton types only enter the report incidentally, as no towings were available, most of the material being derived from dredgings in shallow bays or harbors. The great range in depth of the waters of the area and the many converging currents account in part for the richness in number of species and individuals. An important similarity appears between the forms found at Campeche Bay in the Gulf of Mexico and those of the Philippines; the difficulty in explaining this by a water connection is stressed.—A long list of species noted is appended, with especially copious morphological and nomenclatorial notes. The following new species are given: *Achnanthes cocconeiformis, A. compacta, A. tenuistauros, Actinocyclus bipartitus, A. decussatus,* **Allonitzschia** n. gen., *A munifica, Amphiprora limpida, Amphora alternata, A. clathrata, A. compacata, A. cucumeris, A. dichotoma, A. dura, A. flexa, A. Henshawaii, A. lunaris, A. pauca, A. recessa, A. sima, Arisodiscus adeei, Asteromphalus areolatus, Aulacodiscus pretiosus, A recedens, Auliscus philippinarum, A. quadratus, Biddulphia objecta B. cingulata, B. cornigera, B. cycloides, B. discursa, B. exacta, B. fractosa, B. informis, B. inverta, B. retiformis, B. rudis, B. trisinua, B. turrigera, B. undulosa, Campylodiscus bilateralis, Campylodiscus ligulosus, C. perspicuus, Chaetoceras hebes,* **Chyrsanthemodiscus** n. gen., *C. floriatus, Climacosphenia scimiter, Cocconeis circulifera, C. citronella, C. ocellata, C. os-pristis, Coscinodiscus ciliatus, C. nano-lineatus, C. scitulus Cyclotella crassilineata, Cymatoneis definata, C. lacunata, C. sufflata, Dimerogramma fluens, D. opulens, D. prismaticum,* **Echinodiscus** n. gen., *E. vermiculatus, Endictya margaritifera, Glyphodesmis acus, Grammataphora fundata, G. probata,* **Henshawia** n. gen., *B. Biddulphioides, Hercotheca inermis, Hyalodiscus annulus, H. aspersus, H. hirtus, H. properplanus, Mastogloia achnanthioides, M. capax, M. fusiformis, M. imitatrix, Melosira dura, M. incompta, Navicula bigemmata, N. branchiata, N. caeca, N. corpulenta, N. cyclops, N. delecta, N. funiculata, N. glabrissima, N. imitans, N. indigens, N. mendica, N. molesta, N. ocellata, N. partita, N. patricia. N. philippinarum, N. pseudoclavata, N. pudens, N. pugio, N. pulverulenta, N. retrostauros, N. semistauros, N. simulator, N. spiculifera, N. suffocata, N. translucens, N. turgescens, N. vesparella, N. bisculpta, N. zebuana, Plagiogramma distinctum, Pleurosigma acus, P. dolosum, P. falx, P. obesum, P. obtusum, P. prisma, Rhabdonema sutum, Scoliopleura partistriata,*

Stictocyclus n. gen., *Surirella Bertillonii, S. concentrica, S. contigua, S. continuata, S. cuneatella, S. gravis, S. imitans, S. orientalis, S. significans, S. suluensis,* **Tribrachia** n. gen., *T. pellucida, Trigonium contumax, T. diaphanum, Trinacria limpida, T. tripedalis, Tropidoneis phantasma, T. vaga.* The following is cited as a new combination: *Biddulphia scitula* (Schmidt) Mann. The following new names are given to known forms: *Actinoptychus parvus, Amphora tumulifer, Biddulphia concava, Biddulphia pygmaea, Chaetoceras medusa, C. princeps, Mastogloia cebuensis, Navicula inexacta, N. mimula, N. suboscitans, N. turgescens, N. vesparella,* and *Stictocyclus varicus.—Wm. Randolph Taylor.*

759. Naumann, E. **Specielle Untersuchungen über die Ernährungsbiologie des tierischen Limnoplankton II. Über den Nahrungserwerb und die natürliche Nahrung der Copepoden und der Rotifere des Limnoplanktons. [Special investigations on the nutritional biology of the animal limnoplankton II. The natural food of the copepods and rotifers of the limnoplankton.]** Lunds Univ. Arskrift n.f.2, 19[6]: 1–17. 1924.—The utilization of small plankton algae as food by copepods and rotifers and also in some cases the types used and the conditions developed in the alimentary tracts, are discussed.—*Wm. Randolph Taylor.*

760. Nienburg, W. **Eine eigenartige Lebensgemeinschaft zwischen Fucus und Mytilus. [An interdependence for life between Fucus and Mytilus.]** Ber. Deutsch. Bot. Ges. **43:** 292–298. *1 fig.* 1925.—Fucus plants are found growing on soft, shallow mud flats attached to shells of living *Mytilus edulis.* Without this attachment the Fucus would be unable to grow on the very soft mud and the Mytilus would be unable to exist there alone, since because of the softness of the mud, the animals would sink so far that they would be unable to breathe or secure food.—*Wm. Randolph Taylor.*

761. Pavillard, J. **Observations sur les Diatomées (4°Ser.) Le genre Bacteriastrum.** Bull. Soc. Bot. France **71:** 1086–1090. *Fig. A–C.* 1925.—The author, in examining the preparations of Tempere and Peragallo bequeathed by E. Guignard to the Botanic Institute of Montpellier, has demonstrated that *Bacteriastrum varians* has been treated by many authors as having too wide a range of variability. It is necessary to introduce into the systematics of the genus *Bacteriastrum* a scientific precision based upon geographic distribution and morphology, the resources of which are far from being exhausted. A bibliography for 1860–1922 is appended.—*J. Chifflot (translated by J. M. Fogg, Jr.).*

762. Schiller, J. **Über die Besiedlung europäischer Meere mit Cryptomonaden und über einen Flagellaten peridineenähnlicher Organisation. [The Cryptomonad vegetation of European seas, and a Flagellate with a Peridinean-like organization.]** Oesterreich. Bot. Zeitschr. **74:** 194–198. *1 fig.* 1925.—In contrast to the current acceptance of great richness of the ocean in Cryptomonads the author establishes the fact that the Adriatic Sea, The North Sea and the Gulf of Naples are quite poor in these organisms. In the material from Gulf of Naples may be found the especially interesting Cryptomonad, Entomosigma n. gen., *E. peridinioides* n. sp., which was brought into culture. In 5 days, although the individuals were more numerous, no stages in the life cycle were obtained. *Entomosigma* is the 1st flagellate with 2 unequally long flagella, the shorter of which vibrates in a slightly curved longitudinal furrow and the other in an encircling position. The special flagellar apparatus shows relationships with the Peridiniaceae. The new species establishes a type of flagellate with close connection between the Cryptomonads and the Gymnodiniaceae.—*H. Cammerloher (translated by W. R. Taylor).*

763. Schmidt, A. **Atlas der Diatomaceenkunde. [Atlas of Diatomaceae.]** Issued by Friedrich Hustedt. Heft **90.** *Pl. 357–360.* 1925.—The following new species and varieties are figured, without technical descriptions but with occasional critical notes: *Surirella effusa* from Lake Tanganyika; *S. nodosa* from Cameroon; *Mastogloia emarginata, M. subminuta* and *Orthoneis Horvathiana* Grun. var. *robusta* from Borneo; *Surirella gallapagensis* from Galapagos Islands; *S. affinis* from Venezuela; *S. strigosa* from Scotland; *S. subhybrida* from Pernambuco; *S. taeniata* from Port Townsend; *S. nankoorensis* from Nankauri; *S. tropica* from the South Seas; *S. mediterranea* from Naples, and *S. campechianae* from Campêche Bay. (See also Bot. Absts. 14, Entry 6425).—*Wm. Randolph Taylor.*

764. Sjöstedt, L. Gunnar. **Ein neues Sargassum von der Osterinsel.** [In: Skottsberg, Carl. (Editor.) **The natural history of Juan Fernandez and Easter Island.** Vol.

II, Botany Part 3. *P. 241–448. Pl. 21–27 (2 col.).*] *P. 311–314.* Almquist & Wiksell: Uppsala, 1924.—A Latin description is given of *Sargassum Skottsbergii* Sjöstedt n. sp. from Paschal Island on littoral rocks near Hanga Piko.—*Author.*

765. Strøm, K. Münster. **Freshwater algæ from Juan Fernandez and Easter Island.** [In: Skottsberg, Carl. (Editor.) **The natural history of Juan Fernandez and Easter Island. Vol. 2. Botany Part II.** *P. 59–240. Pl. 6–20 (1 col.).*] *P. 85–93. Fig. 1.* Almquist & Wiksell: Uppsala, 1922.—The collections were so poor that only 25 species have been listed, the majority of them subaërial and inundated rock algae which thrive well under extremely humid conditions in the fog region. They are all cosmopolitan or of unknown distribution. —*Author.*

766. Toni, G. B. de. **Un aggiunta al algarum Zanardini.** [**An addition to the algae of Zanardini.**] Atti R. Inst. Ven. Sci. Lett. Art. **82**: 475–485. 1923.—This is a catalog of Siphonales, some Siphonocladiales and a few other genera in the herbarium of G. Zanardini, with geographical notes.—*Wm. Randolph Taylor.*

767. Transeau, E. N. **The genus Debarya.** Ohio Jour. Sci. **25**: 193-201. *Pl. 1–2.* 1925. —The forms included in this genus are discussed from the historical standpoint, and their morphology and the method of spore formation is outlined. Extended diagnoses of the genus and of 13 species are given, with an analytical key. This covers the forms as far as known throughout the world. *Debarya spiralis* (Fritsch) Transeau and *D. pectinata* (Fritsch) Transeau are offered as new combinations.—*Wm. Randolph Taylor.*

768. Wille, N. **Vorarbeiten zu einer monographie der Chroococcaceen.** [**Notes preliminary to a monograph of the Chroococcaceae.**] Edited by K. Münster Strøm. Nyt Mag. Naturvidensk. **62**: 169–209. *Pl. 6–14.* 1925.—There are presented Wille's memoranda on various Chroococcaceae as he had assembled them for the critical notes in a proposed monograph of the family. The genera *Chroococcus* and *Gloeocapsa* are fairly complete, the others fragmentary. *Aphanocapsa flava* (Kg.) Rabenh. is of animal origin. *Chroococcus roseus* (Menegh.), *Gloeocapsa purpurea* Kg., *Microcystis minor* Kg., and *M. rufescens* Mart. are considered doubtful. The figures are generally from samples of the original collections from which the species are described.—*Wm. Randolph Taylor.*

769. Wołoszynska, J. **Rozmieszczenie glonow osiadlych na dnie jezoria Wigierskiego.** [**Distribution of algae on the bottom of Wigry Lake.**] Compt. Rend. Stat. Hydrobiol. Wigry **1**: 1–66. *3 pl., 38 fig.* 1923.—The different substrata on which algae grew are described in detail. Two zones are distinguished: A zone of green algae to a depth of 7 m. and a zone of diatoms from 7 to 50 m. The 1st zone is divided into a belt of free algae such as *Scenedesmus, Pediastrum, Euastrum,* etc., and a belt of attached algae such as filamentous Chlorophyceae, *Gongrosira, Coleochaete,* stalked diatoms, etc. The zone of diatoms includes a band of growth at less than 20 m. where the diatoms acquire their greatest development in abundance and variety; a 2nd to about 35 m., where the diatoms are somewhat impoverished; and a 3rd zone between 35 and 50 m., yet poorer and where the pelagic forms predominate. Notes are included on 2 new forms of *Pediastrum Boryanum,* on *Opephora Maryti* (Herib.) Meister, on *Epithema Hyndmandii* W. Sm., and *Cymatopleura Solea* var. *pygmea* Pant.—[*Condensed from rev. in Revue Algologique Z 1: 164, by P. Allorge.*]—*Wm. Randolph Taylor.*

770. Zimmerman, Walther. **Helgoländer Meeresalgen. Beiträge zur Morphologie, Physiologie une Oekologie der Algen. I-VI.** [**Helgoland marine algae. Contributions to the morphology, physiology and ecology of the algae I-VI.**] Wissenschafl. Meeresuntersuchun Deutsch. Meere in Kiel u. Biolog. Anstalt Helgoland. Abt. Helgoland 16^1: 1–25. *1 pl.* 1924. —*Rhodomonas baltica, Platymonas tetrathele, Prasinocladus lubricus, Chlorocystis Cohni, Codiolum petrocelidis* and *Sphacelaria fusca* were studied, the Platymonas, Chlorocystis and Sphacelaria being new for Germany, and the Rhodomonas new for Helgoland. In *Rhodomonas* the cell structure, the growth of the chromatophore color and the phototactic motion were especially studied. Of the other species, cytological and developmental studies were made. *Prasinocladus lubricus* and *Chlorodendron subsalsa* are different developmental stages of the same species. There are 2 principal types of cell polarity: The flagellate type, where alteration of the polarity is only effected by turning of the entire cell, and the brown-algal type, where a turning of the physiological polarity may not produce displacement of the morphological cell axis.—*Author (transl. by W. R. Taylor).*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entries 307, 315, 437, 452, 1183, 1233)

771. Arnaudow, Nikola. **Über Transplantieren von Moosembryonen. [The transplantation of moss embryos.]** Flora **118–119**: 17–26. *Fig. 1–4.* 1925.—The author emphasizes the fact that the vaginule and the foot of the sporophyte in mosses are not in close contact but separated by a space filled with slime. Two series of experiments are described. In the 1st, embryos were transplanted, in many cases successfully, from their own vaginules into other vaginules of the same species and developed normally and usually at about the same rate as those of control plants. Transplantations of this type were carried out with material of *Catharinea undulata* and *Polytrichum commune.* In the 2nd series, embryos were transplanted into vaginules of different species. Excellent results were obtained when embryos of *Dicranum scoparium* were transplanted into vaginules of *Catharinea undulata.* These developed somewhat less vigorously than the embryos of control plants but produced capsules with fairly normal peristomes. Their spores, however, showed a tendency to germinate within the capsules.—*A. W. Evans.*

772. Brotherus, V. F. **Musci Insulae-Paschalis. [Mosses of Easter Island.]** [In: Skottsberg, Carl. **The Natural History of Juan Fernandez and Easter Island. Vol. 2. Botany.**) *P. 241–246. Pl. 21–23.* Almquist & Wicksell: Upsala, 1924.—During their visit to Easter Island in 1917, C. Skottsberg and his wife devoted particular attention to the bryophytes. The author here enumerates the mosses of their collection, 14 in number, the following being described as new and figured: *Campylopus dicranodontioides, C. hygrophilus, C. saxicola, C. turficola, Fabronia macroblepharioides, Fissidens pascuanus,* and *Papillaria pascuana* Thér. Except in the case of the last species, Brotherus is the authority for the new names.—*Author.*

773. Brotherus, V. F. **Musci novi sinenses, collecti a Dre Henr. Handel-Mazzetti, II. [New Chinese mosses collected by Handel-Mazzetti, II.]** Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.), Abt. I. **133**: 559–584. 1924.—The 1st part of this paper has been abstracted (see Bot. Absts. 134 Entry 2651). In the present part, 3 new genera and 51 new species are proposed. The new genera are the following: **Ditrichopsis**, based on *D. gymnostoma* n. sp.; **Handeliobryum**, based on *H. himalayanum* and *H. setschwanicum* n. spp., and **Sciaromiopsis,** based on *S. brevifolia* n. sp. and *S. sinensis* (Broth.) n. comb. (formerly *Sciaromium sinense* Broth.). The new species, aside from those already mentioned, are as follows: *Anacolia sinensis, Anomodon grandiretis, Barbula ditrichoides, B. setschwanica, B. subcontorta, B. yünnanensis, Brachymenium crassinervium, Breutelia setschwanica, Bryum chrysobasilare, B. leucophylloides, B. turbinatoides, B. yünnanense, Camptochaete sinensis, Claopodium piliferum, Dicranum papillidens, D. truncicola, Fabronia enervis, Fauriella robustiuscula, Fissidens brevinervis, F. irrigatus, Floribundaria horridula* (with the new var. *rufescens*), *F. setschwanica, Gollania eurhynchoides, G. robusta, G. tereticaulis, Grimmia Handelii, G. micropyxis, Leptodontium pergemmascens, Leptopterigynandrum incurvatum, L. stricticaule, Leucodon latifolius, Meteorium rigidum, Orthotrichum callistomoides, Plagiothecium subulatum, Pogonatum muticum, P. setschwanicum, Pseudoleskea setschwanica, P. yünnanensis, Pterobryopsis Handelii, P. setschwanica, P. yünnanensis, Rhegmatodon Handelii, Stereophyllum setschwanicum, Tortella yünnanensis, Trichostomum parvulum, Tristichium sinense,* and *Webera ciliifera.—H. Cammerloher* (*translated and revised*).

774. Campbell, Douglas Houghton. **The relationships of the Anthocerotaceae.** Flora **118–119**: 62–74. *Fig. 1–5.* 1925.—The distinctive features of the Anthocerotaceae are described and compared with those of certain algae, pteridophytes, hepatics and mosses. The following conclusions are reached: (1) that the group differs sufficiently from other archegoniates to warrant its separation as a distinct class, the Anthocerotes, coördinate with the Hepaticae and Musci; (2) that the gametophyte is probably the most primitive among the bryophytes; (3) that the submersed sex organs are primitive in origin rather than secondary; (4) that the group is, in a sense, synthetic; (5) that the relationship with the Hepaticae is

obscure, but that the derivation of the Hepaticae from the Anthocerotes is as plausible as the derivation of the latter group from the lower Hepaticae; (6) that an actual relationship between the Anthocerotes and the Musci, through *Sphagnum*, is conceivable; (7) that the discovery of almost independent sporophytes in *Anthoceros fusiformis* (see Bot. Absts. 13, Entry 2653; 14, Entry 4440) supports the theory of antithetic alternation of generations in the pteridophytes; (8) that the strong resemblance between the large sporophytes of *A. fusiformis* and those of the Devonian Rhyniaceae warrants an assumption of a relationship between this fossil group and the Anthocerotes; and (9) that the existing pteridophytes are probably polyphyletic in origin, perhaps derived from similar (but not necessarily related) ancestors with sporophytes comparable with those of *Anthoceros*.—*A. W. Evans.*

775. Crabtree, J. H. **British mosses and how to identify them.** *62 p. 72 fig.* ("How to identify" series 19.) The Epworth Press: London, 1924.—In this popular handbook the author describes in non-technical language 57 species of the more common British mosses, the species being illustrated by half tone reproductions of photographs. Each moss is designated by an English name followed by the Latin name in parentheses.—*A. W. Evans.*

776. Culmann, P. **Note sur les stations du Fissidens grandifrons. [Note on the stations of Fissidens grandifrons.]** Bull. Soc. Bot. France **71**: 652. 1924.—The author points out that known European stations for *Fissidens grandifrons* are either in the Pyrenees Mountains or in the Rhine Valley, the species reaching much higher altitudes in the Pyrenees. He suggests that its absence from the higher Alps may be due to the copious deposits of sand in the beds of the swiftly flowing streams, where the plant would naturally occur.—*A. W. Evans.*

777. Douin, Ch. **L'énigme du Plagiochila Stableri W. H. Pearson. [The enigma of Plagiochila Stableri.]** Bull. Soc. Bot. France **71**: 1207–1215. *Fig. 1–12.* 1924.—The author, after giving a short historical acount of *Plagiochila Stableri*, describes certain forms of *P. asplenoides* (L.) Dumort. and expresses the opinion that *P. Stableri* really represents a protonemetal or juvenile condition of this very variable species, analogous to the lateral branches of *Metzgeria furcata* var. *ulvula*. He finds that clusters of the so-called *P. Stableri* may sometimes be found on the leaves of *P. asplenioides*, where spores have germinated, and that the basal portion of the branches in this species may show the features of *P. Stableri* more or less clearly. He explains the dimorphism of the leaves on the basis of his theory of initials and thinks that the majority of the leafy hepatics may show leaves of a different type at the base of a branch, representing a reversion to an earlier stage of development. On the basis of the evidence brought forward he reduces *P. Stableri* to varietal rank under *P. asplenioides* as var. *Stableri* (Pearson) Douin.—*J. Chifflot (translated).*

778. Douin, Ch. **Recherches sur le gamétophyte des Marchantiées. IV. Lois de la coalescence chez le Muscinées.]** Rev. Gén. Bot. **36**: 433–450. 1924.—The first 3 parts of this series have been abstracted (see Bot. Absts. 13, Entry 1812; 14, Entry 497). In this, the 4th part, the author discusses the laws governing the coalescence of tissues in the Bryophytes. He finds that, in the apical development of thalli, the organs, as well as their initials, are united. If the fused initials separate, the thalli become free from one another. In basal development, in order that organs shall be united, it is necessary that the cells which produce the organs shall not only unite but that their action shall be simultaneous.—*E. F. Castetter.*

779. Grout, A. J. **Mosses with a hand-lens. A popular guide to the common or conspicuous mosses and liverworts of the north-eastern United States.** *3d ed.* **Liverworts** by M. A. Howe. *xv + 339. Pl. A + 1–72, fig. 1–160, 1–46.* A. J. Grout: New York, 1924.—The 1st edition of this work, with 74 pages, appeared in 1900; the 2nd, with 223 pages, in 1905. In the present edition the text on the mosses is essentially the same as in the 2nd, with the addition of a few species and a chapter on the life history and development, suitable for a text in schools and colleges. The text on the hepatics, which has been revised by M. A. Howe includes a considerable number of additional species and a full account of the life history and development of *Marchantia* and *Porella*. The appendix contains a habitat key for both mosses and hepatics, designed for the novice or student who has occasion to make determinations. The illustrations include nearly 100 reproductions of photographs, most of which were taken by the author. In these the magnification are up to 10 diameters, and in several cases inserts of the natural size are given.—*A. J. Grout.*

780. Györffy, Istvan. **Kritische Übersicht der Standorte von Molendoa Sendtneriana in der Tatry Polskie. [A critical review of the localities of Molendoa Sendtneriana in the Polish Tatra.]** Acta Soc. Bot. Poloniae 2: 212–215. 1924.—Although *Molendoa Sendtneriana* has been repeatedly recorded from the Tatra Mountains, the author shows that many of the reports are based on incorrect determinations. He then gives a corrected list of stations for the Polish portion of the range.—*H. Czeczott.*

781. Herzog, Th. **Theorie und Tatsachen der Moosverbreitung und die Rolle des Peristomapparatus. [Theories and facts regarding the distribution of mosses and the role of the peristome.]** Flora **118–119**: 198–226. 1925.—The author shows that a division of the surface of the earth into floral realms and provinces, based on the distribution of the bryophytes, would be essentially the same as one based on the distribution of the vascular plants. He emphasizes the fact, however, that the bryophytes have been largely neglected by the students of plant geography. On account of their minute spores it has been assumed that their dissemination by the wind has been practically unrestricted and that they cannot therefore yield data of any value in questions of plant distribution. Schmidt has estimated, for example, that the spores of *Polytrichum*, having a diameter of 8–10μ, would be carried 19,000 km. by a wind of 10 m. per second, while those of *Lycopodium*, having a diameter of 28μ, would be carried only 330 km. On the basis of such figures the views commonly held would perhaps be warranted, but the author shows that winds are never constant in direction for very long distances and that their courses are often complicated by countercurrents of various kinds It is within definite areas, therefore, rather than in unlimited fields, that the small size and lightness of the spores come into play in the dissemination of bryophytes by the wind. Here the great significance of these qualities is shown by the occurrence of common species in all favorable localities of a given region and by the ease with which certain species colonize new localities as these become available. The efficiency of the wind as a distributing agent may be reduced also by showers, which carry the spores to the earth, and in forests the air-currents are often so feeble as to be negligible. The tendency of spores to cling closely to moist surfaces acts as a further deterrent to the wind's activities. In response to these various factors the forests of the tropics show many epiphytic bryophytes and a relatively well-marked endemism. In northern forests, on the other hand, certain widely distributed species occur in spite of the difficulties involved in spore dissemination.—The active mechanisms for spore-dispersal, developed by the sporophytes themselves, are of secondary importance when compared with the wind, and the various types of capsules found in the mosses can hardly have arisen as adaptations to special needs or as responses to selective processes. The author admits that the peristome represents an efficient opening and closing mechanism but maintains that the various types of dehiscence have been brought about by internal factors (which have nothing to do with spore-dispersal), such as the position of the capsule, the length of the time involved in development, and the processes taking place in the division of the sporogenous cells and the maturation of the spores. In support of these views he gives a list of widely distributed cleistocarpous species, in which the capsule has no arrangements whatever for actively discharging and scattering its spores. The influence exerted by the position of the capsule is shown by comparing pendent and erect capsules in a group of selected species. There is often a marked tendency for the more highly developed peristomes to be associated with the pendent capsules, while the erect capsules may show more rudimentary peristomes, and a similar tendency for peristomes of this type to be associated with small spores is usually apparent. The factors determining spore-dimensions, however, are involved, and large spores are often found in species where germination takes place rapidly, sometimes within the closed capsule. Under these circumstances large spores may occur in capsules with complex peristomes. Cleistocarpous capsules and capsules without peristomes are often found in species where the development must be rapid on account of the instability of the habitat, a condition well exemplified in the mosses of river banks. They are characteristic also of many alpine and arctic species, where unfavorable conditions bring about interruptions in the development. The facts here brought forward show how much easier it is to demonstrate the efficiency of the various types of peristomes than to explain why these types came into existence.—*A. W. Evans.*

782. Jørgensen, E. **Notiser til Norges levermosflora II. [Notes on the hepatics of Norway.]** Bergens Mus. Aarb. **1924–25**: (Naturvid. raekke 4): 1–11. 1925.—The 1st number of this series has been abstracted (see Bot. Absts. 11, Entry 1637). In the present number the author gives critical notes on the following species of hepatics, with especial reference to their occurrence in Norway: *Adelanthus decipiens* (Hook.) Mitt., the Norwegian records for which are very improbable; *Frullania Oakesiana* Aust., reported for the 1st time for Europe on the basis of material collected near Oslo by Wulfsberg in 1868 and by Kiaer in 1879; *Microlejeunea ulicina* (Tayl.) Evans; *Plagiochila spinulosa* (Dicks.) Dum., the Norwegian records for which were based on species of *P. punctata* Tayl.; *P. tridenticulata* Tayl., new to Norway; *Radula Carringtonii* Jack, the Norwegian records for which were based on a pale gemmiparous form of *R. aquilegia* Tayl.; *Scapania Massalongii* K. Müll.; *S. ornithopodoides* (With.) Pearson; and *Tritomaria scitula* (Tayl.) Jørgensen.—(Abstracted largely from English summary.)—*A. W. Evans.*

783. Malta, N. **Ueber Zygodon viridissimus (Dicks.) R. Br. in Siebenbürgen und den Süd-Karpathen. [Zygodon viridissimus in Siebenbürgen and the southern Carpathians.]** Folia Cryptogamica **1**: 53–56. *Illus.* 1925.—The author notes the occurrence of the following 3 varieties of *Zygodon viridissimus* in southern Hungary: var. *occidentalis* (Correns) Malta in Siebenbürgen; var. *dentatus* (Breidl.) Limpr. (*Z. dentatus* Breidl.) in the Topologul Valley, Transylvanian Alps; and var. *vulgaris* Malta, the most abundant form of the Carpathian Mountains. Var. *occidentalis*, distinguished by broad entire leaves and very large yellowish brood bodies of about 2 rows of cells, is primarily an Atlantic variety and explanations are suggested for its inland occurrence. Var. *dentatus*, hitherto known only from southern Norway, has teeth at the apices of the leaves and reddish brown brood bodies of 2 rows of cells. Var. *vulgaris* has brood bodies usually composed of a single row of cells.—*A. J. Grout.*

784. Mühldorf, A. **Sphagnum Wulfianum Girgens. în Bucovina. O contribuţie la conservare a monumentelor naturale în România. [Sphagnum Wulfianium in Bucowina. A contribution toward the conservation of natural monuments in Rumania.]** Bull. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **5**: 1–6. 1925.—The southernmost station for the rare *Sphagnum Wulfianum* is near Poiana Stampi, Rumania, but its existence there is seriously threatened. In his description of the moss the author corrects certain statements of Warnstorf regarding the size of the spores and the structure of their walls.—*Al. Borza (translated).*

785. Papp, C. **Contribution à la flore bryologique de la Moldavie. [Contribution to the bryophytic flora of Moldavia.]** Ann. Sci. Univ. Jassy **13**: 100–111. 1924.—The author enumerates 87 species of hepatics and mosses from the districts of Iaşi and Neamţ, and the mountains of Rarău and Ceahlău in eastern Rumania.—*Al. Borza.*

786. Potier de la Varde, R. **Récoltes bryologiques en Afrique anglaise. [Bryological collections in British Africa.]** Bull. Soc. Bot. France **71**: 1054–1060. *Fig. 1–3.* 1924.—The author enumerates 32 species of mosses from a collection made by R. P. Soul, a French missionary in British Africa. Some of the specimens came from Usambara and the others from 2 localities in the Kilimanjaro region. The collection extends the known range of several mosses, and the following 3 species are described as new: *Acanthocladiella kilimanscharica* Broth. & P. de la V., allied to *A. flexilis* (Ren. & Card.) Fleischer of Madagascar; *Campylopus anguste-limbatus* Thér. & P. de la V.; and *C. Lavardei* Thér., allied to *C. paludicola* Broth.—*H. des Gayets (translated).*

787. Radian, Şt. Simeon. **Anatomia aparatului vegetativ de la Bucegia romanica Radian. [The anatomy of the vegetative apparatus of Bucegia romanica.]** Bul. Ştiinţe Nat. **26**[6]: 3–77. *134 fig.* **[Publicaţiile Societăţii Naturaliştilor din România No. 6.]** 1923.—The genus *Bucegia*, with the single species *B. romanica*, is known at present from the Carpathian Mountains of eastern Europe and from British Columbia. By means of detailed analyses and excellent illustrations the author brings out the characters which distinguish the genus from the other Marchantiales. The features especially emphasized are the following: The dioicous inflorescence; the stalked antheridial receptacle; the areolae of the thallus surface, imperceptible to the naked eye; the compound stomata; the spongy green tissue; the lack of prosenchymatous cells in the midrib, these being present in *Preissia;* the lack of slime-canals,

these being present in *Fegatella;* the lack of oil-bodies, these being present in *Fimbriaria Lindenbergiana;* the variable ventral scales; and the origin of the rhizoids from definite initials of the ventral epidermis but not from the ventral scales. The discontinuous distribution of the species indicates, in the author's opinion, that it represents a relic of the Tertiary montane flora. Since the stomata of *B. romanica* are like those of *Preissita commutata* while the air-chambers, midrib and keel resemble those of *Fimbriaria Lindenbergiana,* he suggests that the plant may perhaps be a hybrid of these 2 species.—*Al. Borza (translated).*

788. Reimers, H. **Hepaticae novae chilenses.** [**New Chilean Hepaticae.**] Repert. Spec. Nov. Regni Veg. **21**: 264–265. 1925.—The following 3 species, based on material collected by A. Hollermayer at Panguipulli, Chile, are proposed as new: *Cephaloziella heterophylla, Madotheca planiuscula,* and *Plagiochila minutiretis.*—*A. W. Evans.*

789. Stephani, Franz. **Species Hepaticarum.** Vol. 6. *P. 497–544.* 1924.—The author here continues from page 496 of the preceding instalment (see Bot. Absts. 14, Entry 8995) the appendix to the entire work. The genera considered are taken up in the following sequence, the number of species described being indicated in each case: *Balantiopsis,* 6; *Diplophyllum,* 4; *Scapania,* 12; *Radula,* 34; *Pleurozia,* 1; *Madotheca,* 28; and *Frullania* (incomplete), 33. The geographical distribution of these species is as follows: Asia, 38; Africa, 6; tropical North America, 12; South America, 39; Pacific Islands (including Australia), 23. The following species are apparently described for the 1st time, Stephani being the authority except where otherwise noted: *Balantiopsis caledonica* (New Caledonia), *B. corticola* (New Caledonia), *B. pusilla* (Australia), *Diplophyllum exiguum* (Hawaii), *D. longilobum* (Japan), *D. sendaicum* (Japan), *Frullania apiahyna* Gottsche (Brazil and Bolivia), *F. Arsenii* (Mexico), *F. bomboizana* (Ecuador), *F. caespitans* Beauverd (Bolivia), *F. Chodatii* Beauverd (Bolivia and Mexico), *F. cuneatistipula* (Mexico), *F. erosolimbata* (East Africa), *F. Formosae* (Formosa and Hawaii), *F. fissiloba* (Mexico), *F. grandiloba* (Mexico), *F. Grayana* (New Zealand), *F. Howeana* (Solomon Islands), *F. Iishibae* (Japan), *F. incisostipula* (Mexico), *F. kaluensis* (Hawaii), *F. Knightiana* (Australia), *F. ocanniensis* (Colombia), *F. parva* (Mexico), *F. rupicola* (Mexico), *F. Sawadae* (Japan), *F. subcordistipula* (Mexico), *F. subnigra* (Japan), *Madotheca Armitana* (New Guinea), *M. calcarata* (India), *M. Cardoti* (Colombia), *M. cuculliloba* (Japan), *M. Elberti* (India), *M. fusco-virena* (Mexico), *M. hebridensis* (New Hebrides), *M. Herzogii* Beauverd (Bolivia), *M. heterophylla* (Japan), *M. hirta* (Japan), *M. hirtella* (New Caledonia), *M. indica* (India), *M. keniana* (East Africa), *M. lancistipula* (India), *M. madurensis* (India), *M. pusilla* (Japan), *M. rikuzana* (Japan), *M. Schroederi* (East Africa), *M. spinulosa* (Japan), *M. wakawana* (Japan), *Pleurozia hispida* (New Guinea), *Radula abnormis* (Japan), *R. Arsenii* (Mexico), *R. autoica* (Usambara), *R. ceramensis* (Ceram), *R. coniloba* (Borneo), *R. constricta* (Japan), *R. dominicensis* (Dominica), *R. fissifolia* (San Thomé), *R. heterophylla* (India), *R. hyalina* (Japan), *R. indica* (India), *R. lejeuneaeformis* (Hawaii), *R. Micholtzii* (Solomon Islands), *R. multiramosa* (Annabon Island), *R. Nietneri* (Ceylon), *R. parvitexta* (New Guinea), *R. pauciramea* (Hawaii), *R. ramicola* (New Guinea), *R. rara* (India), *R. Foreauana* Beauverd (India), *R. sendaica* (Japan), *R. similis* (New Caledonia), *R. Sprucei* (Colombia), *R. tayabensis* (Philippine Islands), *R. tridens* (New Caledonia), *Scapania Andreana* (India), *S. conifolia* (Japan), *S. grandiloba* (New Caledonia), *S. informis* (Japan), *S. iwakiensis* (Japan), *S. manina* (Hawaii), *S. minutidens* (Ecuador), *S. nuda* (Japan), *S. paucidens* (Japan), *S. spathulifolia* (Philippine Islands) and *S. subnuda* (New Guinea). For the various genera here treated in full the species recognized by the author now total as follows: *Balantiopsis,* 21; *Diplophyllum,* 28; *Madotheca,* 181; *Pleurozia,* 11; and *Radula,* 255.—*A. W. Evans.*

790. Stephani, Franz. **Species Hepaticarum.** Vol. 6. *P. 545–763.* 1924–1925.—In pages 545–568 the author brings to a conclusion the appendix to the entire work (see Bot. Absts. 13, Entry 7803; 14, Entries 506, 507, 2766, 3611, 8995). The genera taken up are in the following sequence and the number of species described under each genus is indicated: *Frullania* (conclusion), 21; *Jubula,* 3; *Stictolejeunea,* 2; *Omphalanthus,* 1; *Archilejeunea,* 4; *Ptychanthus,* 3; *Mastigolejeunea,* 8; *Thysananthus,* 8; and *Bryopteris,* 1. These species are distributed as follows: Asia, 11; Africa, 3; tropical North America, 4; South America, 12; Pacific Islands (including Australia), 21. The following species are apparently described for the

1st time, Stephani being the authority except where otherwise noted: *Archilejeunea apiculifolia* (India), *A. parvistipula* (Cameroons), *A. Wattsiana* (Australia), *Bryopteris fissiloba* (Trinidad), *Frullania bambusana* (New Guinea), *F. binominata* (Australia), *F. Bradeana* (Costa Rica), *F. columbica* (Colombia), *F. controversa* Beauverd (Bolivia), *F. crenatiloba* (Hawaii), *F. effusa* (Mexico), *F. Ledermannii* (New Guinea), *F. madens* (New Guinea), *F. pandanicola* (New Guinea), *F. pendulostyla* (Ecuador), *F. ponapeana* (New Guinea), *F. sendaica* (Japan), *F. Simmondsii* (Australia), *F. subcommutata* (Samoa), *F. trichomorpha* Beauverd (Bolivia), *F. ultima* Beauverd (New Guinea), *Jubula Camboueána* (Madagascar), *J. gracilis* (Japan), *J. trifida* (New Guinea and Formosa), *Mastigolejeunea camerunensis* (Cameroons), *M. honoluluana* (Hawaii), *M. inflatiloba* (Java), *M. losbanosa* (Philippine Islands), *M. malaccensis* (Malacca), *M. Mariana* (China), *M. Micholtzii* (New Guinea), *Ptychanthus crispifolius* (New Guinea), *P. grossidens* (Java), *Stictolejeunea Micholtzii* (Samoa and Atafu Island), *S. rotundifolia* (West Indies), *Thysananthus crispatus* (New Guinea), *T. densus* (China), *T. erosus* (New Guinea), *T. hebridensis* (New Hebrides), *T. integerrimus* (New Guinea), *T. lacerostipulus* (New Guinea), and *T. rotundistipulus* (India). In the last genus there is also a new combination proposed, *T. ungulatus* (Mitt.) Steph., based on *Lejeunea ungulata* Mitt. of India. For the various genera here treated the species recognized by the author total as follows: *Archilejeunea*, 74; *Bryopteris*, 14; *Frullania*, 698; *Jubula*, 16; *Mastigolejeunea*, 63; *Omphalanthus*, 4; *Ptychanthus*, 30; *Stictolejeunea*, 4; and *Thysananthus*, 42. The concluding pages of the volume represent the work of the editor, G. Beauverd, and include the following: A list of errors and corrections (4 pages), a bibliography and explanation of abbreviations used (48 pages), a list of the genera of the Hepaticae according to Stephani's system (2 pages), and an index to the genera, species and synonyms described or mentioned in the 6 volumes of the work (141 pages). Among the corrections Beauverd proposes the following new names to replace certain homonyms described by Stephani: *Anthoceros Australiae* for *A. crispus* Steph., 1916, not Sw., 1788; *A. Stephanianus* for *A. parvulus* Steph., 1916, not Schiffn., 1899; *Calypogeia Stephaniana* for *C. heterophylla* Steph., 1924, not Steph., 1908; *Frullania decipiens* for *F. galapagona* Steph., 1911, not Ångstr., 1873; *F. Esenbeckiana* for *F. grossiloba* Steph., 1911, not Steph., 1910; *F. fuscobrunnea* for *F. fallax* Steph., 1910, not Gottsche, 1911; *F. insularis* for *F. Renauldii* Steph., July, 1911, not Steph., Feb., 1911; *Isotachis Sprucei* for *I. trifida* Steph., 1922, not Spruce, 1885; *Jamesoniella Stephaniana* for *J. robusta* Steph., 1917, not Spruce, 1876; *Jungermannia Faurieana* for *J. decurrens* Steph., 1918, not Nees, 1830; *J. inonensis* for *J. prostrata* Steph., 1901, not Sw., 1788; *J. Karsteniana* for *J. montana* Steph., 1901, not Mart., 1817; *Lepidozia andicola* for *L. appendiculata* Steph., 1922, not Steph., 1909; *Lophocolea patagonica* for *L. rotundistipula* Steph., 1922, not Steph., 1906; *L. saxicola* for *L. rupicola* Steph., 1922, not Steph., 1906; *Plagiochila brasiliensis* for *P. falcata* Steph., 1902, not Hook., 1844; *P. dulutebrunnea* for *P. effusa* Steph., 1918, not Steph., 1895; *P. dolichocytis* for *P. erronea* Steph., 1918, not Steph., 1902; *P. Herzogiana* for *P. heterophylla* Steph., 1918, not Lindenb., 1857; *P. insulindica* for *P. Winteri* Steph., 1922, not Steph., 1902; *P. Ledermanniana* for *P. cucullifolia* Steph., 1922, not Jack & Steph., 1892; *P. Mildbreadiana* for *P. andongensis* Steph., 1917, not Steph., 1904; *P. sambusana* for *P. rhombifolia* Steph., 1923, not 1892; and *P. Sydneyensis* for *P. Remyana* Steph., 1921, not Steph., 1903.—*A. W. Evans.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

J. E. Flynn, *Assistant Editor*

(See also in this issue Entries 307, 359, 360, 370, 377, 462, 594, 861, 892, 895, 897, 902, 1112, 1141, 1143, 1149, 1153, 1188, 1200, 1233)

FUNGI

791. Arnaudow, Nikola. **Untersuchung über den Tiere fangenden Pilz Zoophagus insidians Som. [Investigation of the animal catching fungus, Zoophagus insidians.]** Flora 118–119: 1–16. *5 fig.* 1925.—Gemmae are the 1st reproductive bodies to appear in cultures in which the nutrition through the catching of rotifers is progressively luxuriant. These are normal structures and are not to be regarded as modifications of reproductive organs of other types. Sexual reproduction rarely occurs. Oogonia and antheridia are terminal on branched or unbranched suspensors, which are borne on long special (male or female) hyphae. The sexual reproduction indicates relationship to the Pythiaceae rather than to the Saprolegniaceae. A study was made of the growth of isolated gemmae and of fragments of mycelium, to determine whether the animal catching habit is obligate, or whether the fungus is also saprophytic, living in part on organic substances in the water. There is no indication that the latter occurs. If no animals are caught the growth of the mycelium is limited and can be accounted for by the food in the gemma. The rapidity of growth after catching an animal is very striking, especially if the interval between catches is longer than is necessary for the digestion of an animal.—*A. G. Stokey.*

792. Chapman, A. Chaston. **The yeasts; a chapter in microscopical science.** Nature 115: 839–841. 1925.—This is abridged from the presidential address to the Royal Microscopial Society.—*O. A. Stevens.*

793. Cool, Cath. **Bijdrage tot de mycologische flora van Nederland. [Contribution to the mycological flora of the Netherlands.]** Nederland. Kruidk. Arch. 1924: 217–221. 1925. —A number of species of Basidiomycetes are mentioned as being new to the Netherlands.—*J. C. Th. Uphof.*

794. Doidge, Ethel M. **South African ascomycetes in the National Herbarium. Part III.** Bothalia 1: 195–221. *Fig. 1–9.* 1924.—Descriptions are given of 50 species, most of which were collected in the forests of the Knysna, George, and Humansdorp districts. These include the following new species, authority, unless otherwise indicated, being Doidge: *Hysterographium spinicolum, H. acaciae, Cyclotheca Bosciae, Macowaniella myrsinicola, Polyrhizon celastri, Hysterostoma Faureae, Palawaniella Dovyalidis, Asterinella Pterocelastri, Asteromyxa inconspicua, Parasterina reticulata, P. laxa, Asterina gerbericola, A. streptocarpi, Amazonia Goniomae, Morenoella Phillipsii, Irene implicata, Meliola Knowltoniae, Perisporium irenicolum, Phaeostigme circumsedeus, Phaeodimeriella plumbea, Rizalia confusa, Trichothyrium elegans, T. robustum, Actinopeltella nitida, Calonectria capensis, Phyllachora anthistiriicola* Syd., *P. Chrysopohonis* Syd., *P. Digitariae* Syd., *P. Doidgeae* Syd., *P. Leptocarydii* Syd., *P. Winkleri* Syd. and *P. Brachytegiae.—Author.*

795. Draper, A. A. **Production of mycelium by Oidium albicans.** Jour. Infect. Diseases 36: 484–485. 1925.—The ash of carrots appeared to contain matter favoring mycelium development of *Oidium albicans.* Protein and carbohydrate matter in carrots did not favor this type of growth.—*R. L. Starkey.*

796. Elliott, John A. **A cytological study of Ceratostomella fimbriata (E. & H.) Elliott.** Phytopathology 15: 417–422. *Pl. 15–16.* 1925.—The cells of the vegetative hyphae, the asexual spores, and the sexual organs of the fungus are uninucleate. The sexual organs, carpogonium and antheridium, arise as branches from apparently neighboring hyphae; the antheridium twists about the carpogonial branch which then becomes swollen at the base and differentiates into a basal ascogonium and a trichogyne. The trichogyne is merely a slender extension from the ascogonium, is not separated by a cross wall, and does not con-

tain a nucleus. It fuses with the antheridium at any point of contact with it. The single nucleus from the antheridium passes through the trichogyne into the ascogonium and fuses with the egg nucleus. After a resting period the fusion nucleus divides, the ascogonium gives rise to ascogenous hyphae, and the nuclei migrate in pairs into the ascogenous hyphae and continue conjugate division. The ascogenous hyphae are comparatively long and profusely branched, and they fuse with thin walled cells which line the inner wall of the perithecium and probably act as nutritive cells. The ascus develops directly from the end of a branch without the formation of an ascus hook. The end of the hypha swells, the swollen part containing 2 nuclei. The 2 nuclei fuse and then divide immediately to form 8 nuclei around which the spores are cut out. The ascus wall soon disintegrates, leaving the spores free in the perithecial cavity.—*B. B. Higgins.*

797. Kniep, H. **Aus dem Entwickelungsgang der hoheren Pilze (Basidiomyceten). [The course of the development of the higher fungi (Basidiomycetes).]** Zeitschr. Pilzkunde **1**: 8–14. *Fig. 1–3.* 1922.—This is a brief general account of the development of the Basidiomycetes. Nuclear behavior in the basidium, spore germination, the origin of the binucleate mycelium, the formation of clamp connections, and sexuality are discussed.—*J. E. Flynn.*

798. Marchal, El., et Em. Marchal. **De l'homothallisme de quelques Ascomycetés. [The homothallism of certain ascomycetes.]** Bull. Cl. Sci. Acad. Roy. Belgique **9**: 8–13. 1923.—The experimental method introduced by Blakeslee for the study of the sexuality of the fungi is shown to be rich in results. The authors have applied this method to certain types of Ascomycetes. Mycelium has developed from single spores of *Hypocopra fimicola* Sacc., *H. macrospora* Sacc., *Sordaria tetraspora* Wint., *Philocopra setosa* Sacc., *P. curvicolla* Sacc., *Sporormia intermedia* Auersw., and *Chaetomium elatum* Kunze, and in every case single spore cultures have formed normal perithecia and viabile spores. These Ascomycetes must therefore be considered as homothallic.—*E. Marchal (translated).*

799. Marchal, Em. et F. Sternon. **Les champignons parasites de Belgique noveaux pour la flore belge, récoltés in 1915–1918. [Parasitic fungi of Belgium, new to the Belgian flora, collected in 1915–1918.]** Bull. Soc. Roy. Bot. Belgique **55**: 48–53. *Pl. 1.* 1922.—About 150 related species of parasitic fungi (chiefly Fungi Imperfecti) are recorded, which up to the present have not been reported in Belgium; of these 5 species are new to science: *Phyllosticta campanulicola* March. & Stern., *Ascochyta Melissae* March. & Stern., *Septoria Chamomillae* March. & Stern., *Myxosporium Salicis* March. & Stern., *Philidium Linariae* March.; and *Ovularia Cotyni* March. & Stern. The authors give technical diagnoses.—*E. Marchal.*

800. Martin, Ella M. **Taphrina communis and Taphrina mirabilis.** Phytopathology **15**: 431. 1925.—A correction is made in citations of these 2 species as given in an article by the author: Phytopathology 15: 67, 1925.—*B. B. Higgins.*

801. Massia, G., and L. Grigoraki. **Sur une épidermophytie occasionnée par une espèce nouvelle: Aleurisma lugdunense. [A skin disease produced by a new species: A. lugdunense.]** Compt. Rend. Soc. Biol. **91**: 1381–1383. 1924.—Morphological and cultural characters are given. The clinical characters would have led one to place it in the genus *Epidermophyton* and attention is called to the necessity of employing cultural characters.—*Oran Raber.*

802. Mohler, John R. **Mycotic stomatitis of cattle.** U. S. Dept. Agric. Dept. Circ. 322. *1–7.* 1924.—An inflammation of the mucous membrane of the mouth of cattle, which results from the eating of forage containing fungi. It is probable that more than 1 species is involved. Suspicion has been directed toward *Uromyces* on clovers. The fungus of rape, etc., *Polydesmus excitiosus,* is very irritating to the mouths and feet of cattle. *Puccinia* and *Penicillium* have been credited with the production of stomatitis.—*L. R. Hesler.*

803. Shear, C. L. **The life history of the Texas root rot fungus, Ozonium omnivorum Shear.** Jour. Agric. Res. **30**: 475–477. *Pl. (col.) 1, fig. 1–2.* 1925.—The Texas root rot fungus, first referred by Pammel to *Ozonium auricomum* Link, has been shown by the author to be distinct and was named *Ozonium omnivorum* Shear. For many years the fungus was known as a sterile mycelium. Duggar, in 1916, reported the presence of conidia on the typical mycelium of the Ozonium. He referred this conidial condition to *Phymatotrichum,* giving it the name *Phymatotrichum omnivorum* (Shear) Duggar. Taubenhaus and Killough claim

to have confirmed Duggar's work by producing conidia in pure culture. The author has now found what he believes to be the perfect stage of this fungus, which he describes and illustrates as *Hydnum omnivorum* n.sp. The evidence of its genetic relation to *Ozonium* is based upon the finding of a wilting plant of an osage orange (*Maclura aurantiaca* Nutt) occurring in the margin of a spot where cotton was dying from the root rot. The typical Ozonium mycelium was found on the base and root of this plant and extending in continuous white or yellowish strands up the stem of the osage orange plant, where the hymenium of the Hydnum developed, surrounding the green living stem at 3 different points and producing typical yellow spines.—*Author.*

804. Shear, C. L., and B. O. Dodge. **The life history of Pilacre Faginea (Fr.) B. and Br.** Jour. Agric. Res. 30: 407–417. *Pl. 1–2.* 1925.—*Pilacre faginea* possesses 2 distinct phases of development. The gametophytic or conidial stage has the general appearance of a Rhinotrichum or a Haplaria. The hyphae are light brown in color, rather coarse and without clamp connections. The basidial or sporophytic stage arises from the mycelium of the conidial stage after the development of clamp connections. These hyphae are snow white and rather fine. The basidia arise from clamp connections and increase in number by proliferation. The fusion nucleus undergoes 2 divisions, the mature basidium consisting of 4 uninucleate cells. The so-called peridium consists merely of the intertwined irregular end branches of sporophytic hyphae. The authors regard the fungus as a Protogasteromycete and adopt and recommend the generic name *Pilacre* with *P. faginea* as the nomenclatorial type of the genus because this name has been established and in general use for the fungus for the past 74 years.—*Authors.*

805. Vuillemin, Paul. **Classification normale, classement auxiliaire et groupement pratique des Champignons. [Normal classification, auxillary classing, and practical grouping of the fungi.]** Compt. Rend. Acad. Sci. Paris **180**: 102–106. 1925.—The normal classification is based on the reproductive bodies, and hence is not applicable to many fungi. The auxillary classing is based on asexual structures. These 2 are concordant in the Phycomycetes: Oosporeae = Zoosporeae; Zygosporeae = Cyclosproeae. In the higher fungi, however, the sporiferous apparatus may be alike in basidiomycetes and ascomycetes, or different in species of the same genus. The asexual organs of these higher fungi are conidia, hemispores, and thallospores; accordingly, there are 3 classes. The last, the Thallosporeae, is divided into the Blastosporeae and the Arthrosporeae, according to whether the spores are globular or rod-like. The Arthrosporeae are divided into the 2 families: Mycodermaceae and Nocardiaceae. The 1st of these families consists of 2 tribes: Mycodermae and Aleurismae. The 1st has 3 genera and the latter 5. The author is unfavorable toward the tendency of some botanists to modify the botanical classification with respect to the toxicity or edibleness of the species.—C.H. *Farr.*

806. Wollenweber, H. W., and C. A. Reinking. **Aliquot Fusaria tropicalia nova vel revisa. [Some new or revised tropical Fusaria.]** Phytopathology **15**: 154–169. 1925.—The paper consists of descriptions of 19 Fusaria isolated by Reinking in connection with his study of banana wilt in Central America. The study by the 2 authors was made during the Fusarium Conference held at Madison, Wisconsin, June to August, 1924. Of the Fusaria, 8 are described as new species (*Fusarium chlamydosporum, F. comptoceras, F. longipes, F. neosceras, F. macroceras, F. bostrycoides, F. alluviale,* and *F. ensiforme*); 5 as new varieties (*Fusarium bullatum* Sher. var. *minus* and var. *brevius;* and *F. moniliforme* Sheld. var. *erumpens,* var. *subglutinans,* and var. *maius*); and 1 as a new form (*Fusarium fructigenum* Fr. var. *maius* Wr., f. 1). Other Fusaria isolated were identified with the following previously described species: *Fusarium semitectum* Berk. & Rav., *F. bullatum* Sherb.; *F. anthophilum* (A. Br.) Wr., *F. moniliforme* Sheld., *F. fructigena* Fr., and *F. theobrome.* The section *Moniliforme* Sherb., including subsection *Constrictum* Wr., of section *Elegans,* is given the new name *Liseola;* this section and several old ones are concisely described.—*C. D. Sherbakoff.*

807. Zeller, S. M., and C. W. Dodge. **Leucogaster and Leucophlebs in North America.** Ann. Missouri Bot. Gard. **11**: 389–410. *Pl. 11.* 1925.—In this monograph all known species of these 2 genera are listed and described with particular emphasis given to American species. Of the 14 described species of *Leucogaster,* 8 are found in North America only, 5 in Europe

only and *Leucogaster luteomaculatus* Z. & D. is found both in North America and Europe. *Leucogaster araneosus*, *L. fulvimaculosus*, *L. luteomaculatus*, and *L. rubescens* are described as new, while *Leucogaster* (*Leucophleps*) *odoratus* (Harkness), *L.* (*Leucophleps*) *foveolatus* (Harkness), *L.* (*Leucophleps*) *citrinus* (Harkness) and *L.* (*Hymenogaster*) *anomalus* (Peck) appear as new combinations. The European species *Endogone Tozziana* Cavara & Saccardo appears as *Leucogaster Tozziana* (C. & S.) Mattirolo in litt., n. comb. From the study of young stages of *Leucogaster floccosus* Hesse and the discovery that the heretofore known spore forms of *Leucogaster odoratus*, *L. foveolatus* and *L. citrinus* are imperfect spore forms resembling the basidiospores of *Leucogaster*, it seems probable that eventually *Leucophleps* will be recognized as a chlamydosporic condition of *Leucogaster*, or retained as a form-genus of the *Fungi Imperfecti*. No basidiomycetous stage has been discovered for *Leucophleps magnata* Harkness and *L. candida* Harkness, the 2 remaining species of the genus. From the description of *Hydnangium liospermum* Tulasne, it seems quite likely that this species should be referred to *Leucophleps*. Without opportunity to study authentic material, however, the transfer has not been made.—*S. M. Zeller.*

LICHENS

808. Du Rietz, G. Einar. **Kritische Bemerkungen über die Parmelia perlata-Gruppe. [Critical remarks upon the Parmelia perlata group.]** Nyt Mag. Naturvidensk. **62**: 63–83. 1925.—After severely criticizing the schematic use of the chemical reactions in lichenology, the author discusses the forms of *Parmelia crinita* and creates a new species, *P. Tuckermanii*, for the South American form. Finally, he reviews the European species of the *P. perlata* group. The new names, new combinations, and emendations proposed are: *P. cetrarioides* and varieties *typica* and *rubescens*, *P. trichotera* and varieties *typica* and *Claudelii*, and *P. Arnoldii*.—*K. Münster Strøm.*

809. Du Rietz, G. Einar. **Lichenologiska fragment. VII. Om Physcia nigricans (Floerk.) Stitz. emend. DR. jämte en kort översikt över de skandiviska Physcia-arterna av sektionen Sordulentae Wain. [Lichenological fragments. VII. Physcia nigricans (Floerk.) Stitz. emend. DR., with a short survey of the Scandinavian species of Physcia, sect. Sordulentae Wain.]** Svensk Bot. Tidskr. **19**: 70–83. 1925.—Physcia tremulicola Nyl., previously known from but a few localities in Fennoscandia, was found by the author to be rather common in many parts of Sweden. He found the species to rather variable, no sharp line existing between it and *P. sciastrella* Nyl. The Central European specimens of the latter species were found to be identical with *P. tremulicola*. The species should bear the name *P. nigricans* (Floerk.) Stitz. emend. DR. A list of synonyms is added. An account of the morphology of the species is given, as well as a complete list of Scandinavian localities. A key to the Scandinavian species of this group with notes on different species is included. The species here dealt with are: *P. pulverulenta* (Schreb.) Nyl., *P. grisea* (Lam.) Zahlbr., *P. constipata* (Nyl.) Norrl. & Nyl., *P. ciliata* (Hoffm.) DR., *P. orbicularis* (Neck.) DT. & Sarnth., *P. sciastra* (Ach.) DR., *P. nigricans* (Floerk.) Stitz. emend. DR. and *P. elaeina* (Sm.) A. L. Sm. Finally, some additions are made to earlier publications on *Xanthoria fallax* (Hepp.) Arn., *Rinodinacolobina* (Ach.) Th. Fr. and *Pertusaria carneonivea* (Anzi) Wain.—*O. Heilborn.*

BACTERIA

810. Anonymous. **Power alcohol from tuber and root crops.** Nature **115**: 890. 1925.—Reference is made to a government publication and the use of yeasts and bacteria.—*O. A. Stevens.*

811. Achitouv, M. **Mensuration des courbures des Spirochètes. [Measuring the curves of Spirochaetes.]** Compt. Rend. Soc. Biol. **91**: 1192–1194. *1 fig.* 1924.

812. Arnold, L., E. R. Balthazar, and R. C. Drago. **Staphylococci from the liver, gallbladder and intestine of normal dogs.** Jour. Infect. Diseases **36**: 413–418. 1925.—From studies of 63 healthy dogs, staphylococci were found in the bile from the gallbladder in 4 and streptococci in 1. In 44, *Staphylococcus albus* was found in the scrapings of the gallbladder mucosa. These were not pathogenic for dogs or rabbits. No relationship was found between the bacteria present in the cystic mucosa and the duodenum.—*R. L. Starkey.*

813. Bernard, P. Noël. **Diagnostic bactériologique de "Bacillus asthenogenes."** [The bacteriological characters of B. asthenogenes.] Compt. Rend. Soc. Biol. 91: 1197–1198. 1924.—This species is a facultative anaerobe which closely resembles *B. megathcrium* de Bary. Morphological and physiological characters are given.—*Oran Raber.*

814. Clawson, B. J. **Studies on the etiology of acute rheumatic fever.** Jour. Infect. Diseases 36: 444–456. *Fig. 1–4.* 1925.—Streptococci were found present in a relatively high percentage of cases of acute rheumatic fever, endocarditis, and chorea. The organisms do not appear to be a homogeneous group. Lesions similar to human rheumatic lesions can be produced experimentally by animal injection. *R. L. Starkey.*

815. Hall, Ivan C. **Bacterial factors in pyorrhea alveolaris. III. The isolation of B. tetani, B. welchii, and other sporulating anaerobes from human saliva.** Jour. Infect. Diseases 37: 87–92. 1925.—Sporulating anaerobes do not appear commonly in saliva and even though found at one time may not be obtained at another period.—*B. welchii, B. tetani, B. bifermentans,* and *B. tetanomorphus* were recovered during an examination of saliva from 43 persons from 10 to 54 years of age.—*R. L. Starkey.*

816. Hall, Ivan C., and Beatrice Howitt. **Bacterial factors in pyorrhea alveolaris. IV. Micrococcus gazogenes, a minute gram-negative, non-sporulating anaerobe prevalent in human saliva.** Jour. Infect. Diseases 37: 112–125. 1925.—Micrococcus gazogenes Lewkowicz was found present in considerable abundance in human saliva in practically all persons examined. It is a minute gram-negative, non-motile, non-sporulating, obligate anaerobe about 0.5μ in diameter. It is largely responsible for the abundant production of gas following introduction of unheated saliva into brain media.—*R. L. Starkey.*

817. Hall, Ivan C., and K. Matsumura. **Recovery of bacillus tertius from stools of infants.** Jour. Infect. Diseases 35: 502–504. 1924.—A facultative anaerobic spore-former, *B. tertius,* was found as a frequent and early invader of the intestinal tract of infants. It was also found in feces of older children and adults as well as in the feces of sheep.—*R. L. Starkey.*

818. Harris, Norman MacL. **A bacteriological note relative to the Franklin Arctic Relief Expedition of 1848.** Science 62: 57–58. 1925.—A specimen of pemmican found in a cache established by the 1848 expedition was carefully sampled for its bacterial flora. A variety of rod-shaped forms and 2 types of micrococci were observed. The following forms were isolated: *Bacterium Welchii, Bacillus cereus* (Frankland) and *Bacillus subtilis* (3 varieties). No nonspore-forming bacteria of the coli-aerogenes group were found, and negative results were obtained from special tests for *Bacillus botulinus.*—*C. J. Lyon.*

819. Henrici, Arthur T. **A statistical study of the form and growth of the cholera vibrio.** Jour. Infect. Diseases 37: 75–81. *3 pl.* 1925.—Almost all of the various cell forms of the cholera vibrio which have been described were observed developing in regular sequence in a normal culture on agar. It is probable, therefore, that many of the apparent morphologic changes of this organism reported in the literature are but variations in the rate of growth on different mediums or of different strains in the same medium. A technique is presented by which morphologic variations in bacteria may be followed quantitatively. Such quantitative observations of changes in cell form of the cholera organism are presented in graphic form. It is shown that the cell changes are correlated with the rate of growth, and that 3 distinct phases can be recognized: An embryonic stage, characteristic of the period of accelerating growth, in which the cells are large and bacillary in form; an adult stage, characteristic of the period of decreasing growth rate, in which the cells assume the typical vibrio form; and a senescent stage, characteristic of the death phase, in which the cells divide into a group of irregular spiral forms and a group of short oval or coccoid forms.—*Author's abstract.*

820. Henrici, Arthur T. **On cytomorphosis in bacteria.** Science 61: 644–647. *1 fig.* 1925.—The term "cytomorphosis" was first used by Minot to describe progressive changes in cells of multicellular organisms and is here used in the same sense to describe regular morphological and physiological variations in bacteria. By applying statistical methods to the results of frequent analyses of cultures of bacteria it has been determined that during the growth of a single culture, 3 types of cells are found, "a young form, an adult

form and a senescent form." The young type is found during the period of accelerating growth, the adult form is associated with the stationary phase of the culture, while the senescent form appears near the point of death. The principal morphological change is that of increase in size, which may be so great as to give an individual 6 times the length of a resting cell (*Bacillus megatherium*). Other changes are those of the granular appearance and staining qualities. Both the rate of growth and the changes in form of the spirillum of cholera are shown. Only the adult forms are spirilla, for they grow from bacilli and die as cocci.—*C. J. Lyon.*

821. Hunter, Albert C., and Bernard A. Linden. **Microorganisms in decomposing oysters.** Jour. Agric. Res. **30**: 971–976. 1925.—In a previous paper on the subject of oyster spoilage (An investigation of oyster spoilage, Amer. Food Jour. **18**: 538–540. 1923), the authors present data indicating that there is no definite relation between the total counts of bacteria and the stage of decomposition in shucked oysters. The present paper gives the results of a study of the types of microörganisms present in decomposing oysters. Several hundred cultures, collected from agar plates in the 1st investigation, were studied morphologically and culturally for the elimination of duplicates and for identification. Records were kept to show the relative abundance of bacterial types during the various stages of spoilage. Experiments were also conducted to test the ability of pure cultures to decompose oysters. It was found that those organisms producing foul odors in decomposing oysters are members of the genera *Serratia* (water and soil bacteria producing red pigment), *Pseudomonas* (soil and water bacteria producing blue-green pigment), *Proteus*, *Clostridium* (spore-forming, obligate anaerobes), and *Bacillus* (aerobic spore-forming bacteria). These types were present during all stages of spoilage. *Aerobacter aerogenes* and *A. cloacae* produced sour odors and acidity in the oysters and were present during all stages of spoilage. *Escherichia coli* and *E. communior* also produced sour odors but were found only during the early stages of decomposition. During the late stages of spoilage when the pH was between 5.0 and 4.6, streptococci, lactobacilli and yeasts predominated. These forms produced acidity, sour odor, or both in the shucked oysters. The organisms which were isolated from oysters and yet in pure culture had no effect on the decomposition of oysters were, for the most part, ordinary non-spore-forming water and soil bacteria of the genera *Achromobacter*, *Eberthella*, *Flavobacterium*, *Micrococcus* and *Staphylococcus*. Some yeasts, having no effect on the oysters, were also isolated. It was learned that washing the oysters in fresh water or brine immediately after shucking had no apparent effect on the character of the bacterial flora causing spoilage. For obvious reasons, however, oysters should be washed thoroughly when shucked.—*Albert C. Hunter.*

822. Jordan, E. O. **The differentiation of the paratyphoid enteritidis group. IX. Strains from various mammalian hosts.** Jour. Infect. Diseases. **36**: 309–329. 1925.—This is a general review of the group from the point of view of the animal sources from which the organisms have been obtained, the diseases with which they have been associated, their cultural properties and distinguishing characteristics.—*R. L. Starkey.*

823. Kahn, M. C. **Anaerobic spore-bearing bacteria of the human intestine in health and in certain diseases.** Jour. Infect. Diseases **35**: 423–478. 1924.—Investigations are reported of the occurrence of anaerobic spore-bearing bacteria in human feces and their possible relationship to certain diseases. From normal persons there appeared non-proteolytic anaerobic spore-bearers in the majority of cases, some strongly proteolytic forms and some weakly proteolytic, the last at times present in considerable numbers. There were generally somewhat smaller numbers of *B. welchii* in the control than in the pathologic cases. There was little evidence to justify a correlation between the presence of anaerobic spore-bearers and cases of intestinal toxemia or chronic diarrhea, but somewhat more correlation between these anaerobes and chronic eczema and chronic arthritis. Findings in cases of pernicious anemia appear to justify further study to determine whether the presence of greater abundance of anaerobic spore-bearers in such cases has primary or secondary significance.—*R. L. Starkey.*

824. Macaulay, H. M. Cameron. **An investigation into pasteurization as a means of destroying tubercle bacilli in milk.** Public Health [London] **38**[10]: 297–301. 1925.—The

present unsatisfactory state of the milk supply of this country is directly responsible for a vast amount of tuberculosis among our young population. Until the universal establishment of tubercle-free herds has been adopted, pasteurization is the best remedy we possess for this condition of affairs. The writer in a series of experiments introduced living tubercle bacilli into the "holder" of a modern pasteurizing plant, during the normal daily working of the apparatus, and found in every case that such bacilli were destroyed—the test of destruction being the inability to produce tuberculosis lesions in a guinea-pig. In the opinion of the writer, both the human and the bovine variety of tubercle bacilli in milk are destroyed by pasteurization for 30 minutes at a temperature of 145°–150°F. As a practical point, it is important that licensing authorities under the Milk (Special Designations) Order, 1923, should satisfy themselves that there is a minimum of frothing in the "holder" of the pasteurizing apparatus.—*Leslie C. Frank* (*Public Health Engineering Absts.*).

825. Moench, L. Mary, M. C. Kahn, and J. C. Torrey. **Analysis of the fecal flora in thirty-three cases of pernicious anemia. With particular reference to B. welchii.** Jour. Infect. Diseases **37**: 161–180. 1925.—Observations on the fecal flora of 33 cases of pernicious anemia revealed unusually large numbers of *B. coli*, streptococci, *B. welchii*, and at times *B. acidophilus*. The abundance of cells of *B. welchii* is believed to be particularly significant. —*R. L. Starkey.*

826. Tunnicliff, Ruth, and Leila Jackson. **Bacillus gonidiaformans n. sp. An hitherto undescribed organism.** Jour. Infect. Diseases **36**: 430–438. *Fig. 1–5.* 1925.—*Bacillus gonidiaformans* n.sp. was isolated from an actinomycosis-like tonsillar granule. It appears as an anaerobic, non-spore-forming, non-motile organism. It is extremely pleomorphic, occurring as a short bacillus, as small and large coccoid bodies, and as masses or filaments of chromatin material. All forms appear to be laden with granules.—*R. L. Starkey.*

827. Wolf, Jan. **Contribution à la morphologie des bactéroides des Blattes. [The morphology of the bacteroids of the cockroach.]** Compt. Rend. Soc. Biol. **91**: 1180–1182. 1924.—In the cockroach, *Periplaneta orientalis* L., the size and shape of the bacteroids vary with the condition, age, and sex of the insect.—*Oran Raber.*

MYXOMYCETES

828. Broeksmit, T. **Verzamelen en bewaren van Myxomyceten. [The collection and preservation of Myxomycetes.]** Nederland. Kruidk. Arch. **1924**: 134–137. 1925.—Unripe sporangia which are still slimy and moist should be gathered in small boxes lined with moist moss. In this way plasmodia also can be collected. The slightest damage causes cessation of development or abnormal growth of fruit-bodies.—*J. C. Th. Uphof.*

829. Widder, F. J. **Myxomycetenfunde in Steiermark. [Myxomycete collections in Styria.]** Verhandl. Zool.-Bot. Ges. Wien **73**: 158–163. *Fig. 2.* 1923.—The new species are: *Physarum heterosporum* and *Arcyria ornata.*—*H. Cammerloher.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

Edward W. Berry, *Editor*

(See also in this issue Entries 307, 308, 323, 532, 774)

830. Anonymous. **Tertiary floras.** [Rev. of: Berry, E. W. **The middle and Upper Eocene Floras of Southeastern North America.** U. S. A. Geol. Surv. Prof. Paper 92. *1–206. 65 pl.* 1924 (see Bot. Absts. 14, Entry 555).] Nature **115**: 819. 1925.

831. Antevs, Ernst. **The climatologic significance of annual rings in fossil woods.** Amer. Jour. Sci. **9**: 296–302. 1925.—The majority but not all of the Paleozoic woods in the Northern Hemisphere lack annual rings. On the other hand, Permo-Carboniferous woods from New South Wales have growth rings, as do most but not all Permo-Carboniferous woods from the Falkland Islands. After the beginning of the Jurassic, most woods of middle and high latitudes have growth rings. Absence and poor development of rings are, however, on record. As is evident from the conditions obtaining at present, and from the paleontological evidence, the lack of rings in most Paleozoic and some Mesozoic woods with normal

radial growth means that they could not develop rings under the conditions of their environment. The lack of rings in these cases, therefore, does not necessarily signify uniform climate, and cannot be given climatologic significance. Some of these old and primitive woods may have lacked the faculty of setting off zones of growth. The annual period, due to the obliquity of the earth's axis to the ecliptic, was present at least as early as the Timiskamian or early Precambrian as proved by annually laminated or varved glacial slates of this age at Sudbury in Canada (A. P. Coleman: The spacing of ice ages and early Precambrian climates. Scientific Monthly 20^5: 473–475, 1925. However, the seasonal periodicity may at times have been much weakened by various terrestrial conditions. Since also the plants and animals may have been little responsive, the few traces of the annual period in the organic remains of Paleozoic age are explainable. Thus, the absence or presence of rings in Paleozoic and Mesozoic woods has but little climatologic significance.—*Author's abstract.*

832. Berry, Edward W. **A species of Musa in the Tertiary of South America.** Proc. Nation. Acad. Sci. [U. S. A.] **11**: 298–299. 1925.—It has been the more widely prevalent opinion that *Musa* is not indigenous to the Western Hemisphere and was not cultivated there prior to its introduction from the Canary Islands, in 1516. Banana-like leaves (Musaphyllum) are known from the Eocene of the western U. S. A. and from the later Tertiary of Central and South America, but the leaves of *Musa* cannot be distinguished from those of *Heliconia*. The seed of *Musa* are, however, unmistakable. The author has received seed of *Musa* collected from coal measures, probably Oligocene, in Colombia. These seed are large and resemble those of *M. ensete* Gmelin.—*Howard B. Frost.*

833. Berry, Edward W. **Fossil plants from the Tertiary of Patagonia and their significance.** Proc. Nation. Acad. Sci. [U. S. A.] **11**: 404–405. 1925.—The author reports 36 determinable forms from the Miocene collected at Lat. 44° 20′ S., representing the following genera: *Myrica, Celtis, Lomatites, Peumus, Leguminosites, Erythroxylon, Icica, Schinopsis, Maytenus, Sapindus, Schmidelia, Cupania, Rhamnidium, Malvacarpus, Sterculia, Tetracera, Banara, Nectandra, Myrcia, Styrax, Arrabidaea, Bignonites, Strychnos* and *Faramea*. These forms give no evidence of African relationships. The fossils include 35 arborescent and liana forms, with mesophytic leaves; they indicate a mild and humid, temperate climate with extensive development of forest. The Andes could not have been sufficiently developed at that time to exclude the moist westerly winds from this region.—*Howard B. Frost.*

834. Berry, Edward W. **Miocene Araceae related to Caladium from Trinidad.** Pan Amer. Geol. **44**: 38–42. *Pl. 5.* 1925.—**Caladiosoma** *miocenica*, a new genus and species of Araceae thought to be ancestral to *Caladium*, is described from the Miocene of the Island of Trinidad.—*Author.*

835. Berry, Edward W. **The flora of the Ripley formation.** U. S. Geol. Survey Prof. Paper **136**: 1–94. *Pl. 1–23.* 1925.—The Ripley formation is the youngest Upper Cretaceous in southeastern North America. The author describes from this horizon 135 species of plants, chiefly from 2 localities in western Tennessee. Eighty-six are new to science, and genera not before known from the pre-Tertiary are *Dioscorites, Celtis, Capparis, Cedrela, Dillenites*, and *Chrysophyllum*. The other genera in which new species are described are: *Raphaelia, Alismaphyllum, Juglans, Myrica, Dryophyllum, Fagus, Artocarpus, Ficus, Mimosites, Caesalpinites, Dalbergia, Euphorbiophyllum, Celastrophyllum, Acer, Rhamnus, Zizyphus, Grewiopsis, Ternstroemites, Nectandra, Laurus, Laurophyllum, Myrcia, Aralia, Cornophyllum, Andromeda, Bumelia, Apocynophyllum, Calycites, Phyllites, Carpolithus.* There are 9 monocotyledons and 105 dicotyledons. All of the species and 35 of the genera are extinct. The geology and ecology are also discussed. The age is about the same as the Montana group of the western U. S. A., that is, it is pre Laramie, thus indicating a considerable time interval between the Cretaceous and the Eocene in the Atlantic Coastal Plain.—*Author.*

836. Chaney, Ralph W. **A comparative study of the Bridge Creek flora and the modern Redwood forest.** Carnegie Inst. Washington Publ. **349**: 1–22. *Pl. 1–7.* 1925.—After formulating the principles governing his determinations, the author discusses the composition of the Bridge Creek flora and the climate and topography which it indicates, concluding that its environment must have been essentially like that of the existing coast range redwood forest, that is, in river valleys with a moist, mild and equable climate. He concludes also that the age is probably upper Oligocene instead of upper Eocene as previously supposed.—*E. W. Berry.*

837. Chaney, Ralph W. **The Mascall flora—Its distribution and climatic relation.** Carnegie Inst. Washington Publ. **349**: 23-48. *Pl. 1.* 1925.—The composition and distribution of the Mascall Miocene flora of Oregon, and its equivalents in the western U. S. A. are discussed. The author concludes that it is most similar to the existing Oak-madroño forest of the West with a rainfall of about 30 inches annually.—*E. W. Berry.*

838. Chaney, Ralph W. **Notes on two fossil hackberries from the Tertiary of the western United States.** Carnegie Inst. Washington Publ. **349**: 49-56. *Pl. 1.* 1925.—The writer describes the leaves of *Celtis obliquifolia* n. sp. from the Oligocene of the John Day basin in Oregon, and the stones of *Celtis hatcheri* n. sp. from the White River Oligocene of the Big Badlands of South Dakota.—*E. W. Berry.*

839. Chaney, Ralph W. **A record of the presence of Umbellularia in the Tertiary of the western United States.** Carnegie Inst. Washington Publ. **349**: 57-62. *Pl. 1.* 1925.—The author describes *Umbellularia oregonensis* n. sp. from the Bridge Creek beds of supposed upper Oligocene age in the John Day basin of Oregon.—*E. W. Berry.*

840. Cockerell, T. D. A. **Note on Fagus antipofii.** Torreya **25**: 98–100. 1925.—The author comments on this Asiatic Tertiary species usually credited to Abich, and states that it should be credited to Heer, and that it was not present in North America outside of Alaska, and possibly Greenland.—*E. W. Berry.*

841. Diener, C. **Leitfossilien der Trias.** [**Index fossils of the Triassic.**] Lief 4 of Gürich, G. **Leitfossilien.** [**Index fossils.**] *P. 99–104. Pl. 25–28.* Borntraeger: Berlin, 1925.—In a work largely devoted to animal fossils, the author describes and figures the characteristic calcareous algae which are so common in the dolomitic limestones at certain horizons in the Triassic.—*E. W. Berry.*

842. Erdtman, O. G. E. **Doggerbanktorvens pollenflora och sannolika ålder.** [**Pollen flora and age of Dogger bank.**] Svensk Bot. Tidskr. **19**: 115–116. 1925.—Moorlog from Dogger bank in the North Sea showed 72% pine pollen, 27.5% birch pollen and 0.5% elm and oak pollen. The moorlog has probably been formed in early boreal time.—*O. Heilborn.*

843. Fritel, P. H. **Végétaux paléozoiques et organismes problématiques de l'Ouadaï.** [**Paleozoic plants and problematic organisms of Ouadai.**] Bull. Soc. Géol. France **25**: 33–48. *Pl. 2, 3.* 1925.—The author discusses *Harlania* and *Cruziana* from the Silurian; *Glossofungites lomnicki* n. sp. and *Spirophyton cauda-galli* from the Devonian; and the following plant remains from a horizon that is probably Dinantian: *Pteridorachis, Sphenopteridium, Stigmaria, Ledidodendron veltheimianum* Sternb., aff. *rhodeanum* Sternb., and cf. *volkmannianum* Sternb., *Ulodendron majus* Lind. & Hutt., and *Archaeosigillaria* cf. *vanuxemi* Kidston.—*E. W. Berry.*

844. Jeffrey, E. C. [Rev. of: Potonié, Robert. **Einführung in die allgemeine Kohlenpetrographie.** [**Introduction to the general petrography of coal.**] *271 p. 80 illus.* Gebrüder Borntraeger: Berlin, 1924.] Science **62**: 112–113. 1925.—This volume is written from the botanical standpoint by the son of the late Henry Potonié who is well known as a student of the structure of coal.—*C. J. Lyon.*

845. Jongmans, W. J. **Geologische en palaeontologische beschrijving van het Karboon der omgeving van Epen (Limb.).** [**Geology and paleontology of the Carboniferous near Epen in Limburg.**] Meded. Geol. Bur. Nederland. **1**: 55–83. *Pl. 1–13.* 1925.—An account is given of the geology, invertebrate paleontology and paleobotany of the Carboniferous near Epen in Limburg. The botany is by Walter Gothan who records the following forms, distributed among 4 localities: *Calamites* cf. *suckowi* Brongn., cf. *haueri* Stur, cf. *cistiformis* Stur, cf. *roemeri* Goeppert, *Asterophyllites unguis* n. sp., *tener* n. sp., *Annularia filiformis* n. sp., *Sphenophyllum cuneifolium* Sternb., *Lepidophyllum cultriforme* Lesq., *lanceolatum* Brongn., *linearifolium* Lesq., *Cantheliophorus, Pinnularia, Lagenospermum, Holcospermum, Cardiocarpus, Sphenopteris, Mariopteris, Sigillariostrobus* cf. *nobilis* Zeiller, *Neuropteris schlehani* Stur, *Palmatopteris spinosa* Goeppert, *Sphyropteris epeniana* n. sp., *Alloiopteris sternbergi curta, Cordaites principalis* Germar, cf. *palmaeformis* Goeppert, *Cordaianthus* cf. *volkmanni* Ettings., *crassus* n. sp., *Samaropsis fluitans* Dawson, *fluitans elongata, Pecopteris* aff. *aspera* Brongn., and *minima* n. sp.—*E. W. Berry.*

846. Jongmans, W. J., und W. Gothan. **Beiträge zur kenntnis der flora des oberkarbons von Sumatra.** [**Contributions to a knowledge of the flora of the Upper Carboniferous of Sum-**

atra.] Meded. Geol. Bur. Nederland. 2: 279–303. *Pl. 1–5.* 1925.—The author describes the geology along the Merangin River in Sumatra, where the following plants of a west European Stephanian facies were collected: *Pecopteris arborescens* Brongn., *hemitelioides* Brongn., *Verbeeki* n. sp., ? *polymorpha* Brongn., *Cyclopteris* sp., *Lepidodendron* sp., *Stigmaria* cf. *ficoides* Brongn., *Sphenophyllum oblongifolium* Germar, *Calamites suckowi* Brongn., *Cordaites borassifolius* Sternb. and **Tobleria** *bicuspis*, a new genus and species of seed. This flora is of especial interest because of the Glossopteris floras of surrounding regions such as India, Yunnan and Borneo.—*E. W. Berry.*

847. Knowlton, F. H. **The possible origin of the angiosperms.** Science **61**: 568–570. 1925.—The writer points out the important points in a recent paper by *H. Hamshaw Thomas* (Phil. Trans. Roy. Soc. London, B**213**: 299–363. *Pl. 11–15*, 1925) who has described new fossil material from the Middle Jurassic in Yorkshire. Four genera, each with a single species, have been placed in a single group, Caytoniales. The leaves known as *Sagenopteris phillipsi* were found with the fruit and seed of the Caytoniales and it is suggested that *Sagenopteris* belonged to the new group rather than to the Hydropterideae. The Caytoniales are thought to lie between the Pteridosperms and recent Angiosperms.—*C. J. Lyon.*

848. Merriman, Thaddeus. **The Gilboa fossil forest.** Science **61**: 611. 1925.—Inquiries concerning the distribution of fossil stumps from this Devonian forest may be addressed to the writer.—*C. J. Lyon.*

849. Scott, D. H. **The origin of the seed-plants.** [In: **Phases of modern science.** *240 p. P. 150–158.* A. & F. Denny: London, 1925.—This is a brief popular account of the seed ferns and their significance, and an emphasis of their distinctness from the true ferns. —*E. W. Berry.*

850. Seward, A. C. **Records of ancient plants within the Empire: What we know and what we need.** Rept. Imp. Bot. Conference London **1924**: 323–331. 1925.—This paper contains brief comments on the fossil floras of the Arctic, Canada, Falkland Islands, Antarctica, Africa, India and Australia.—*E. W. Berry.*

851. Thomson, Paul. **En pollenanalytisk undersökning av Estlands mossar. [Pollen analytical investigation of moors in Esthonia.]** Svensk Bot. Tidskr. **19**: 116. 1925.—The results agree with results of investigations in Sweden, with the exception that the spruce appears much earlier in Esthonia (in Atlantic Line).—*O. Heilborn.*

852. Watkins, A. E. **Evolution and the age and area hypothesis.** Nature **115**: 675. *3 fig.* 1925.—The writer suggests that Willis' curves will fit fairly well if genera are supposed to be formed by the dying out of intervening links.—*O. A. Stevens.*

853. Wieland, G. R. **A historic fossil.** Science **61**: 541. 1925.—A wedge cut from the cycadeoid, *Raumeria Reichenbachiana,* which was found in 1753 in the region southeast of Cracow, has been cut from the original and sent to the laboratory at Yale University for investigation.—*C. J. Lyon.*

854. Wilckens, Otto. **Das Alter des groszen mittelrheinischen Bimssteinausbruches. [The age of the great middle Rhein pumice eruption.]** Geol. Rundschau **16**: 306–310. 1925.—The author records from the volcanic ash deposits of the Conder and Brohl valleys near Coblentz a considerable number of fossil plants nearly all of which are still existing species. The genera represented are *Sambucus, Vaccinium, Prunus, Amelanchier, Cotoneaster, Rhamnus, Salix, Carpinus, Populus, Betula, Achillea, Dipsacus, Galium, Verbascum, Lycopus, Sorbus, Urtica, Typha, Carex,* and *Rosa.* The conclusion is reached that these are not "diluvial," that is, Pleistocene, but "alluvial," that is, post glacial; and that they should be referred to the Ancylus age of Scandinavian post glacial chronology, and that they lived from about 5500 to 4000 B.C.—*E. W. Berry.*

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash and Harry Braun, *Associate Editors*

(See also in this issue Entries 7, 10, 38, 49, 55, 88, 94, 104, 106, 108, 109, 131, 138, 140, 143, 147, 149, 153, 173, 175, 220, 221, 307, 322, 360, 377, 449, 452, 497, 564, 571, 601, 621, 626, 634, 640, 654, 659, 671, 697, 703, 711, 734, 796, 801, 802, 803, 806, 811, 817, 823, 978, 1002, 1098, 1128, 1145, 1182, 1188, 1189, 1190, 1194, 1195, 1197)

DISEASES CAUSED BY FUNGI

855. Anonymous. **Die Krebskrankheit der Kartoffel.** [The wart disease of potatoes.] Gartenwelt 28: 171. *2 fig.* 1924.—The following varieties are resistant against wart (*Chrysophlyctis endobiotica*): Thieles Fruheste, Gorsdorfer Nieren, Thieles Kaiserniere, Thieles Kuckuck, Modrows Preusen, von Kamekes Beseler, Magdeburger Blaue, Parnassia, Nepeta and Johannsen. The disease is widely spread over Germany, especially in fields which are fertilized with human excreta and with ash.—*J. C. Th. Uphof.*

856. Arrhenius, O. **Untersuchungen über den Zusammenhang von Gelbrostresistenz und der aktuellen und potentiellen Azidität des Zellsaftes und der Gewebe.** [The relation of resistance to yellow rust to the actual and potential acidity of cell sap and tissue.] Zeitschr. Pflanzenkrankh. 34: 97–101. 1924.—No correlation was found between the H-ion concentration of the cells and of the tissues and the resistance to yellow rust, nor do the author's experiments show any correlation between the titratable acidity and resistance to yellow rust in any one variety.—*H. T. Güssow.*

857. Beeson, K. E. **Common barberry and black stem rust in Indiana.** Purdue Univ. [Indiana] Agric. Exp. Sta. Ext. Bull. 118. *1–8. 7 fig.* 1923.—A survey of the stem rust in certain regions is given, showing the relation of the rust to barberry bushes. Figures on losses are included.—*M. W. Gardner.*

858. Bernard, Ch. **Verslag van het Algemeen Proefstation voor Thee over het Jaar 1924.** [Report of the General Experiment Station for Tea of the year 1924.] Mededeel. Proefstation Thee Nederland.-Indië 91. *1–30.* 1925.—The article gives notes on the occurrence of *Armillaria* and the red root-rot fungus, *Poria*, on tea and also of 2 thread-blights, *Hypochnus theae* and *Marasmius* sp., in Sumatra.—*Carl Hartley.*

859. Bernard, Ch. **Wortelziekten bij thee en rubber.** [Root diseases of tea and rubber.] Thee 5: 75–79. 1925.—This is a summary of information on several fungi. The gray root fungus (*Armillaria*), cause of split canker in tea and Cinchona, and the black root fungi (*Rosellinia* spp.) are particularly favored by excess of organic matter in the soil. The red root fungus (*Ganoderma pseudoferreum*, ex *Fomes pseudoferreus* and *Poria hypolatritia*) prefers heavy soil. The white root fungus (*Rigidiporus microporus*, ex *Fomes lignosus* and *F. semitostus*) appears on all sorts of plants and under all sorts of conditions, but is favored by water in the subsoil. Particularly in the Deli and Siantar districts on white sand and clay soils, the white and red fungi cause great gaps in the plantations, infection being assisted by stumps and trunks left from the original forest. Artocarpus and Ficus wood so left is especially likely to cause infection of the young trees; trunks too large to get rid of should be isolated by ditches. The root-crown disease of tea and *Hevea* (*Ustulina maxima*, ex. *U. zonata*) is a wound parasite, and weeding must therefore be done carefully to avoid wounds on the trees. Control of the root fungi is fairly easy. Drainage and other measures should be employed to insure soil aeration, and lime should be applied. Diseased trees should be removed, root as well as top. In the case of rubber, the roots of neighboring trees should be examined, those infected removed, and resulting wounds treated with carbolineum. In the case of tea, it is cheaper to isolate the infected areas by ditches.—*Carl Hartley.*

860. Briton-Jones, H. R. **Pear leaf blister (Taphrina Bullata, Tul).** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1923: 89–90. 1923.—The degree of infection (summer of 1923) suffered by each of a number of pear varieties grown at Long Ashton, is indicated.—*W. H. Chandler.*

861. Buchheim, Alexander. **Zur Kenntnis des Eichenmehltaus. [Oak mildew.]** Zeitschr. Pflanzenkrankh. **34**: 1–11. *4 fig.* 1924.—In Russia, the perithecia of oak mildew, found in abundance, show great morphological variability. Eight ascospores, however, are the rule. The author is inclined to regard oak mildew as belonging to the collective group of *Microsphaerella alni* (Wallr.) Salm., but he suggests that for biological reasons this European mildew may be referred to for the time as *M. quercina* Foëx. He is able to confirm Neger's findings as to the identity of the oak and beech mildews. No morphological differences exist between the conidia of the mildew of both these trees. In a postscript he adds that the perithecia of oak mildew had been found recently by Blumer near Pern.—*H. T. Güssow.*

862. Carne, W. M. **Cereal smuts.** Jour. Dept. Agric. Western Australia 2nd Ser. **2**: 10–19. *6 fig.* 1925.—Bunt or stinking smut of wheat is described and varietal resistance and factors influencing degree of infection are discussed. The formalin, bluestone, and copper carbonate treatments are described. Brief reference is made to the resistance of the varieties Nabawa, Florence, and Yandilla King to flag smut of wheat.—*P. J. Olson.*

863. Carne, W. M. **Seed treatment for oat smut.** Jour. Dept. Agric. Western Australia 2nd Ser. **2**: 65. 1925.—This is a brief note on the method of applying formalin treatment for the prevention of oat smut.—*P. J. Olson.*

864. Cotton, A. D. **On the occurrence of the silver leaf fungus in Rhododendrons.** Gard. Chron. [London] Ser. III. **77**: 112. 1925.—The disease is due to *Stereum purpureum* and attacks mainly the rose and apple families. Historical notes and control measures are given.—*P. L. Ricker.*

865. Cullinan, F. P., and Clarence E. Baker. **Liquid lime sulphur versus sulphur dust for apple spraying.** Purdue Univ. [Indiana] Agric. Exp. Sta. Bull. 283. *1–22. Fig. 1–8.* 1924.—Field tests were carried out at Peru, Indiana, with sulphur dust and liquid lime sulphur on Ben Davis apple trees over a 5-year period. The foliage and fruit of trees sprayed with lime sulphur were relatively more free from scab than those of dusted trees. Only in years of light scab infection was dust fairly effective. With either dust or liquid spray, the pre-pink application was found very essential for the best control of apple scab.—*Author.*

866. Davis, W. H. **Club-root of Chinese cabbage.** Mycologia **17**: 160–162. *1 fig.* 1925. —Five varieties of *Brassica Pe-tsai* were found susceptible to *Plasmodiophora Brassicae.*—*G. R. Bisby.*

867. Ducomet, V. **Les rouilles des céréales en automne et en hiver. [Cereal rusts through fall and winter.]** Rev. Path. Vég. et Entomol. Agric. **12**: 21–27. 1925.—Rust mycelium may live through the winter in cereal leaves and yield teleutospore sori. Teleutospore production depends on temperature. At a certain low temperature, which still makes mycelial growth possible, teleutospore production is inhibited; as the cold becomes less severe a few small sori appear. At a milder temperature the sori grow larger; in the warm atmosphere of the greenhouse, numerous, small sori are produced. Mild temperatures, succeeding frosts of −5°C. cause *Puccinia glumarum* to develop teleutospores. Renewed activity is delayed for 2–3 days in the case of *P. triticina* and for a longer time in the case of *P. coronifera. P. graminis* was observed to yield very few uredospores but many teleutospores through the winter. —*J. Dufrenoy.*

868. Ducomet, V. **Nouvelles observations sur les Rouilles. [Further notes on rusts.]** Rev. Path. Vég. et Entomol. Agric. **12**: 60–64. 1925.—An experimental field infection by *Puccinia glumarum* was originated by transplanting rusted wheat in a row with non-infected wheat, but infection did not spread as far as 3 m., at the end of 3 months. Natural field infection during winter is believed to originate from uredospores brought into the soil either by rusted leaves or by superficially contaminated grains. The term "teliospores" is more appropriate than the term "teleutospores" as these spores do not necessarily succeed uredospores; indeed, the kind of spores produced depends on ecologic conditions; uredospore production was made to follow teleutospore production when rusted *Phalaris arundinacea* was transplanted into greenhouses, during winter.—*J. Dufrenoy.*

869. Farrell, F. D. **Director's Report 1920–22.** Kansas Agric. Exp. Sta. Rept. **1920–1922**: 1–45. *Fig. 1–4.* 1922.—Wheat foot rot is shown to be present in several sections of Kansas. The organisms associated with the disease are *Helminthosporium* sp., *Wojnowicia*

graminis and what appeared to be *Ophiobolus cariceti*. Soil infestation seems to account for overwintering of the disease. Seasonal conditions are important relative to the extent of damage and the symptoms that occur.—*L. E. Melchers.*

870. Foëx, E. **Quelques mots sur les Erysiphacées. [Notes on the Erysiphaceae.]** Rev. Path. Vég. et Entomol. Agric. **12**: 65–73. 1925.—Conidia of *Sphaerotheca pannosa* germinate readily on the surface of dew drops; they may possibly germinate without any liquid water being present, if the atmosphere is saturated with vapor. Overwintering by means of mycelium in plant tissues, or of chlamydospores between bud scales is discussed for *Podosphaera*, *Sphaerotheca* and *Oïdium*. Oak trees are listed according to their relative susceptibility to *Oïdium*.—*J. Dufrenoy.*

871. Gardner, Max W. **Apple blotch in Indiana.** Trans. Indiana Hort. Soc. **1923**: 71–80. *6 fig.* 1924; Reprinted in Hoosier Hort. **6**: 3–11. 1924.—New information on varietal susceptibility, temperature relations of the causal fungus, and spray control.—*Author.*

872. Gilchrist, Grace. **Bark canker disease of apple trees, caused by Myxosporium corticolum, Edgerton.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1922**: 67–70. 1922.—A description is given of this bark canker disease that apparently had not been observed in England until 1920. Inoculations failed to cause the formation of cankers and it is, therefore, concluded that the fungus is only weakly parasitic and is dangerous only under exceptional conditions. The scars do not increase in size except in late summer or autumn. In one season at Long Ashton, they started growth in October. [See also Bot. Absts. 12, Entry 5825; and 13, Entry 313.]—*W. H. Chandler.*

873. Hartman, R. E., and W. A. McCubbin. **Potato wart.** Pennsylvania Dept. Agric. Gen. Bull. 394. *1–28. 8 fig.* 1924.—The history of potato wart (*Chrysophlytis endobiotica* Shilb.) in the U. S. A. is briefly reviewed. Methods of control are described, especially the necessity for quarantine and the growing of immune varieties in infested regions.—*H. W. Thurston, Jr.*

874. Hasper, E. **Biologie und Bekämpfung des Cladosporium fulvum Cooke auf Solanum lycopersicum. [Biology and control of Cladosporium fulvum Cke. on Solanum lycopersicum.]** Zeitschr. Pflanzenkrankh. **35**: 112–118. 1925.—Spraying every 8–10 days with 0.5% solution of Uspulun is recommended. Thorough ventilation of the greenhouse, exposure of calcium chloride in dishes, destruction of all dead material and careful disinfection of the greenhouse with a 10% solution of phenol, sterilization of the soil and discontinuation of the culture of tomatoes in badly infested greenhouses are also recommended.—*H. T. Güssow.*

875. Hayes, H. K., E. C. Stakman, and O. S. Aamodt. **Inheritance in wheat of resistance to black stem rust.** Phytopathology **15**: 371–387. *Pl. 13.* 1925.—The problem of breeding wheats resistant to stem rust (*Puccinia graminis tritici* Eriks. & Henn.) is rendered more complex by the existence of 40 or more physiologic forms of the fungus, some one or more of which attack nearly all varieties. Furthermore, there appear to be 2 distinct types of resistance. Some varieties show a protoplasmic incompatibility between host and parasite. In such varieties rust infection results in flecking due to the death of the host cells invaded by the fungous mycelium. The fungus then ceases to grow and often fails to produce spores. In the other type of resistance, the host offers mechanical obstructions, such as small stomata or abundant schlerenchyma tissue, which limit entrance and spread of the fungus. Some varieties in the latter class are rather susceptible to seedling infection in the greenhouse tests but show a high degree of resistance in the field. Varieties of *Triticum durum* and *T. dicoccum* are more generally resistant than the common spring wheats of the *T. vulgare* group; but they are much less desirable from the standpoint of yield, milling, and baking quality. The results of the 3 interspecies crosses discussed in this paper show conclusively the possibility of combining the rust resistance of the durum varieties with the desirable qualities of the vulgare varieties. The problem, therefore, is to obtain combinations, by crossing and recrossing, which are resistant to all the physiologic forms of the rust fungus found in a given area and have the desirable qualities of a bread wheat.—*B. B. Higgins.*

876. Heitzmanówna, W[anda]. **Choroba białych lilij. [A white lily disease.]** (English summary.) Ogrodnictwo **19**: 305–306. 1923.—For several years, in the vicinity of Cracow,

a destructive disease of white lilies (*Lilium candidum*) has been observed. Brown spots appear on leaves, shoots and buds of affected plants; these spots increase in size and finally present a gray, dusty appearance. The lower parts of the plant are first affected. The author, working at Jagellonian Univ., Cracow, showed this disease to be due to *Botrytis cinerea.*—*Frederick V. Rand* (*from English summary*).

877. Hiura, Makato. **On a Cercosporellose of the cultivated lily.** (Japanese, with English resume and bibliography.) Ann. Phytopath. Soc. Japan **1**[6]: 20–30. *1 fig.* 1925.—In 1922, an epidemic of this disease of *Lilium Maximowjczii* occurred in parts of Hokkaido, injury being confined largely to the foliage. Morphologically the fungus was found to coincide fairly well with *Cercosporella inconspicua* (Wint.) von Höhnel, but final judgment is reserved until after further investigation. Symptoms are divided into 3 stages: (1) The affected areas show an appearance resembling powdery mildew; (2) the lesions are characterized by a brownish color; and in the final stage (3) a blackened or burned appearance is characteristic. The author found that the causal parasite hibernates in the dead leaves.—*Frederick V. Rand.*

878. Hiura, Makato. **On the dead-arm disease of grape vine in the vicinity of Sapporo.** (Japanese, with English resume.) Jour. Soc. Agric. and Forestry Sapporo **15**: 417 [435]–450. *3 fig.* 1924.—The vine growers in Sapporo have often complained of a disease formerly thought to be winter injury. According to the author's investigations the trouble is caused by a fungus and is apparently identical with the "dead-arm" in America. At Sapporo the disease is not as serious as in America and consequently the growers have neglected to control it, thus causing its widespread distribution in the region. In spite of careful observations the author has not been able to find the Cryptosporella stage, only the Fusicoccum stage being commonly found. No cases of injury to the berries have been observed, but the basal stem injury is so characteristic in Japan that the author has given the Japanese name "Nekubi-Yake" to the disease. The application of lime-sulphur wash in spring was found very effective for control. —*Frederick V. Rand.*

879. Hiura, Makato. **The root-neck blight of the vines near Sapporo.** (In Japanese.) Jour. Soc. Agric. and Forest. Sapporo **16**: 63–78. *3 fig.* 1924.—(See preceding entry.)

880. Kirchner, O. **Der Antherenbrand von Salvia, Ustilago betonicae Beck. [Smut of anthers of Salvia, U. betonicae Beck.]** Zeitschr. Pflanzenkrankh. **33**: 97–104. *3 fig.* 1923. —This fungus was observed on *Salvia pratensis* L. near Hohenheim.—*H. T. Güssow.*

881. Klebahn, H. **Kulturversuche mit Rostpilzen. [Cultural studies of rust fungi.]** Zeitschr. Pflanzenkrankh. **34**: 289–303. 1924.—The infection of pines with aeciospores of *Peridermium pini*, depends upon the susceptibility of the host. There exist susceptible, immune, and less susceptible trees. Susceptibility and immunity are hereditary. In the summer of 1923, of 46 seedlings from rust-infected pines, 23 became infected with the *Peridermium*, while 23 remained sound. Six of the former produced aecia, and 17 showed only swollen shoots in which rust mycelium was determined microscopically. Of the 23 infected trees, 21 were wounded on inoculation, and 2 were uninjured. Of seedlings from sound trees, only 12 showed infection, while 34 remained uninfected. Aecia did not develop. Of the 12 infected plants, 10 were wounded and 2 were not wounded during inoculation. The infection showed itself in all cases on 1922 growth. Natural crosses of host plants in the open apparently are responsible for the infection of certain individuals, the progeny of sound trees, and for the escape of certain individuals, the progeny of infected trees. Wounding trees during inoculation renders infection more easy. The presence of the fungus is not due to any mycoplasm. Inoculation with *P. pini* on *Ruellia formosa* proved unsuccessful.—*Cronartium asclepiadeum* infected the following new hosts: *Loasa lateritia, L. tricolor, Nemesia strumosa, Tropaeolum aduncum, Vincetoxicum nigrum.* The author also records infection of *Pinus silvestris* with teleutospores of *Cronartium asclepiadeum* from *Vincetoxicum.* In regard to teleutospore hosts and the question of overwintering of *Cronartium ribicola* it was found that *Peridermium strobi* did not infect *Vincetoxicum nigrum, V. officinale*, nor *Ruellia formosa.* Klebahn does not believe that overwintering of *C. ribicola* on *Ribes* is of any importance in nature. The records so far are not convincing. The host specialization of *Coleosporium tussilaginis* was studied. Pine leaves inoculated in 1920 with teleutospores showed aecial infection in 1921 and produced a new crop of aecia in 1922, showing that the mycelium may

live for 2 years in pine leaves. Inoculations were made May 11th on *Tussilago farfara*, *Senecio vulgaris*, and *Alectorolophus minor;* the last remained free from infection. On the 24th of May, *Tussilago farfara* was heavily infected, and much against expectation, *Senecio* showed slight infection. The inoculations were repeated with aeciospores on *Senecio* with light infection. Uredospores from *Tussilago* on *Senecio* resulted in sparse infection. Uredospores from *Senecio* on *Tussilago* showed no results except that feeble infection occurred in one case.—*Aecidium grossulariae* was again employed in an endeavor to make *Ribes nigrum* take infection. In the summer of 1924, thirty-one leaves showed 297 spots, most of which remained very small and hardly progressed beyond the production of spermogonia.—In connection with *Puccinia malvacearum* the author discusses Eriksson's mycoplasma theory, with which he cannot agree.—*Puccinia simplex* produced spermogonia on *Ornithogalum umbellatum* and *O. nutans*. Aecia did not mature. The author succeeded in producing uredosori on *Secale cereale* with aecia reared from *Puccinia graminis* on *Agropyrum repens*. He also records the overwintering of *P. dispersa* in the uredo stage, with which he produced vigorous infection on rye.—One lot of teleutospores of *Puccinia menthae* was placed on the surface of the soil of potted species of *Mentha*. Another lot was overwintered in the open and was brushed or sprayed on the growing plants. Soil inoculation proved successful on *M. aquatica*. *M. piperita*, *M. canadensis* var. *piperascens*, *M. silvestris*, and *M. rotundifolia* showed aecidia some little time after infection with spores sprayed on. Transfer of aecia produced uredospores on these plants as well as on *M. viridis;* the latter escaped infection from teleutospores.—Concluding his series, the author discusses culture of rust fungi on artificial media, in which he was unsuccessful.—*H. T. Güssow.*

882. Laubert, R. **Die Welkekrankheit der Astern.** [Wilt disease of asters.] Gartenwelt 28: 463–464. *1 fig.* 1924.—During the summer, asters may suddenly wilt. The disease is caused by a species of *Fusarium*, which is not further described. Nothing is known in regard to combating the disease. Dead plants should be removed and buried deeply.—*J. C. Th. Uphof.*

883. Lauritzen, J. I., and L. L. Harter. **The influence of temperature on the infection and decay of sweet potatoes by different species of Rhizopus.** Jour. Agric. Res. 30: 793–810. *Fig. 1–9.* 1925.—The investigations showed that the 6 species of Rhizopus studied could be placed into 2 groups with respect to the relation of temperature to infection of sweet potatoes. The high temperature group, including *Rhizopus tritici*, *R. oryzae*, and *R. maydis*, has an optimum varying from 32° to 35°C., a maximum of about 42°, and a minimum varying from 3.4° to 9°C. The low temperature group, represented by *R. nigricans*, *R. reflexus*, and *R. artocarpi*, has an optimum of from 18.5° to 24°, a maximum varying from 30° to 34.5°, and a minimum of from 3.4° to 12°. Wounded but uninoculated sweet potatoes become infected in 5–7 days at 9° and in 43 hours and less at 18° to 32°.—*L. L. Harter.*

884. Linford, M. B., and R. E. Vaughan. **Rootrot of peas.** Wisconsin Agric. Exp. Sta. Circ. 188. *1–10. Fig. 1–4.* 1925.—A popular discussion of the symptoms, occurrence and control of pea rootrot.—*R. E. Vaughan.*

885. Magrou, Joseph. **A propos du pouvoir fungicide des tubercles d'Ophrydées.** [**Fungicidal power of the tubercles in the Ophrydeae.**] Ann. Sci. Nat. Bot. 10e Sér. 6: 265–270. *1 fig.* 1924.—The author refers to the work of Noel Bernard (Ann. Sci. Nat. Bot. 9e Ser. 9. 1909; Ibid. 14. 1911) regarding humoral immunity in orchids invaded by symbiotic fungi, and, with variations, repeats and illustrates some of his experiments. An aseptically removed fragment of *Loroglossum* was placed in the base of a tube of nutrient gelatin. *Rhizoctonia repens*, sown at the top, was arrested in its growth midway of the slant by solutes diffusing from the fragment. In control tubes the fungus covered the slant surface. P. Nobbecourt (Compt. Rend. Acad. Sci. Paris 177: 1055. 1923) had performed similar experiments, finding the inhibitory substance inactivated not only by subjecting to 55°, but also by −15°C., and had believed this substance to be a reaction product developed in the orchid tubercle under the influence of toxin secreted by the fungus. To test the latter point the author repeated his first experiment, this time leaving the fragment of *Loroglossum* in the gelatin for 2 weeks, and then removing it before sowing the fungus. In this case practically no growth at all occurred, thus showing that the fungicidal substance, which was shown to be specific,

preexisted in the tubercle. The author's findings are compared with immunological relations in animals.—*Frederick V. Rand.*

886. Maresquelle, H. J. **Compte rendu des rouilles des blés à Bellevue en 1924. [Wheat rust at Bellevue, near Paris, 1924.]** Rev. Path. Vég. et Entomol. Agric. **12**: 56–57. 1925.—*P. glumarum* appeared at the beginning of June; *P. triticina* appeared June 1 and affected Wilhelmina most severely; *P. graminis* rusted most wheats in July, *T. monococcum* itself being rusted.—*J. Dufrenoy.*

887. Moreau, F. **Les maladies des céréales à la Station de Sélection de Semences du Massif Central en 1924. [Cereal diseases at the Experimental Station in Central France.]** Rev. Path. Vég. et Entomol. Agric. **12**: 31–37. 1925.—Hybrids of wheat are listed as to resistance to *Puccinia graminis, P. glumarum,* and *P. triticina.* No definite relation was observed between the severity of rust attack and crop yield for any variety of wheat tested.—*J. Dufrenoy.*

888. Murphy, Paul A., and Robert McKay. **Further experiments on the sources and development of blight infection in potato tubers.** Jour. Dept. Lands and Agric. Ireland **25**: 10–21. 1925.—Most infection takes place at digging, arising from contact with the soil and foliage. Infectiousness of the soil lasted from 2–3 weeks in 1924. Soil contains the most contamination at the surface. Wounds, and especially fresh wounds, increased infection. Most infection becomes apparent within 8 days after inoculation, but some not until after 3 weeks. Blight rot does not spread from one tuber to another in storage, but may pave the way for a soft rot which does spread. These 2 kinds of rot are worse in soil storage than in box storage.—*Donald Folsom.*

889. Nakata, Kakugoro, Tomosuke Nakajima, and Seito Takimoto. **Studies on angular leaf spot of cotton in Korea.** (Japanese.) Bull. Agric. Exp. Sta. Chosen **10**: 1–21. *2 pl.* 1924.—Angular leaf spot of cotton is a common and destructive disease prevailing through nearly all cotton growing sections in Korea. It attacks seedlings, stems, bolls, and leaves and is characterized by angular lesions on the leaves. Occasionally it is associated with many diseases such as leaf blight (*Cercospora gossypina*), leaf spot (*Phyllosticta gossypina, Pestalozzia gossypii*) and anthracnose (*Glomerella gossypii*).—The occurrence of the disease depends upon environmental conditions; lack of potassium fertilizer and wet climate especially favor its prevalence. Of 57 varieties of upland cotton tested, Taxas Water, Franklin Prolific, Hastings Upright and Taisaku Upland are very resistant; King's Improved and Griffin's Improved are less resistant to the disease. Our observations on all cotton varieties in Korea suggest that the Chinese variety stands first and Korean as well as Indian next in resistance. Upland cotton, though a little different in resistance among its varieties, is generally susceptible to the disease.—The causal organism agrees with *Bact. Malvacearum* Smith in all respects except non-formation of windowed colony. The organism is resistant to dryness (2 weeks in desiccator) and to heat (54–55°C. for 10 minutes in wet, 110°C. for 10 minutes in dry heat), and sensitive to lime sulphur (0.4 B. for 30 minutes), Bordeaux mixture (2% for 10 minutes), formalin (0.35% for 60 minutes), carbolic acid (1% for 20 minutes), and corrosive sublimate (0.1% for 5 minutes).—Infection is proved to be through seed. The organism in diseased leaves which are scattered in open fields loses its vitality during winter and has no power to produce the disease in the following season.—The effective measures for control are seed treatments, of which hot water treatment (60°C. for 10 minutes) and chemical treatment (0.1% corrosive sublimate for 10 minutes) followed by delinting with commercial sulphuric acid, are to be recommended for practice. Spraying with Bordeaux mixture is not effective unless it is repeatedly applied.—*Authors* (*Courtesy Japanese Jour. Bot.*).

890. Pater, B. **Eine Beobachtung am Eichenmehltau, Microsphaera quercina Burrill. [Oak mildew.]** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **4**: 25–26. 1924.—In Transsylvania, oak-mildew was first found in 1909 on young branches and leaves. In 1915 it was observed on old oaks (*Quercus peduncula* and *Q. sessiliflora*, but not on *Q. Cerris*) and in 1922 Grinţescu found perithecia. These are the 3 phases of the acclimatization of oak-mildew in Rumania in its progress from west to east.—*Al. Borza.*

891. Petri, L. **Esperienze sul grado di resistenza del Castagno giapponese alla Blepharospora cambivora. [Tests on the degree of resistance of the Japanese chestnut to Blephar-**

ospora cambivora.] Ann. R. Ist. Superiore Forest. Nazion. Firenze 9: (1–9). 1924.—The author discusses briefly the differentiating characters of the various species of the genus *Castanea*. Further experiments have shown that the mechanism of the resistance of Japanese chestnuts is due to a special cytoplasmic activity of the embryonic tissue and to an abundant elaboration of tannic substances in the hyperplastic tissues derived from the cambium and cortical parenchyma.—*R. Ciferri* (*translated by L. C. Cash*).

892. Petri, L. **Nuove osservazioni sulla biologia e sul parassitismo della "Blepharospora cambivora."** [**Further observations on the biology and parasitism of Blepharospora cambivora.**] Ann. R. Ist. Superiore Forest. Nazion. Firenze 9: (1–10). 1924.—*Blepharospora cambivora* Petri is one of the Peronosporaceae related to *Phytophthora cactorum, P. fagi, P. syringea* and *P. nicotianae*. The author does not believe that it is possible to include this fungus in the genus *Phytophthora* from any biological characters—(non-formation of aerial conidia, but solely sporangia submerged in very dilute saline solutions, sterility of the mycelium in non-cortical tissues and formation in the latter of the only sexual organs), nor by secondary morphological characters (very long, simple, sporangiosphores terminating in a single zoosporangium). The fungus may be considered an obligative parasite as far as its sexual reproduction is concerned.—The formation of zoosporangia in nutritive mineral solutions, with the addition of a small quantity of saline substance, shows that calcium favors it in very small quantities; iron in small concentrations has no affect but in relatively high concentrations stimulates the mycelium; the copper-ion in high dilutions hinders the formation of sporangia and almost prevents mycelial growth. From these facts the author deduces the prophylactic value of copper salts in controlling the disease.—The fungus can attack the primary roots of chestnut. —*R. Ciferri* (*translated by L. C. Cash*).

893. Petri, L. **Ulteriori ricerche sopra la "Blepharospora cambivora."** [**Further studies on Blepharospora cambivora.**] Ann. R. Ist. Superiore Forest. Nazion. Firenze 7: (1–13.) 1922.—Infection with this fungus which, according to the author, is the cause of the "ink disease" of chestnuts, occurs only when the chestnut germinates in infected groves. The formation of oospores is favored by a high degree of humidity, a moderate temperature, a slow development of the plants, early infection, and germination of varieties with large fruits. The resistance of Japanese chestnuts to the "ink disease" does not seem to be due to chemical properties of the cell sap but to rapid and deep formation of phellogen. This is apparent from sections of infected chestnut.—*R. Ciferri* (*translated by L. C. Cash*).

894. Ross, Hermann. **Über die Pfefferminzen und deren Befall durch den Rostpilz Puccinia menthae Pers.** [**Peppermint rust, Puccinia menthae Pers.**] Zeitschr. Pflanzenkrankh. 34: 101–107. 1924.—Peppermint rust may be prevented by favorable nutrition and conditions of moisture, as well as by wide spacing of plants.—*H. T. Güssow.*

895. Salmon, E. S., and W. M. Ware. **On the presence of a perennial mycelium in Pseudoperonospora Humuli (Miyabe & Takah.) Wils.** Nature 116: 134–135. 1925.—The presence of mycelium in the pith and cortex of 1 year-old portions of the "crown" of *Humulus lupulus* in May is reported. The disease causes a stunted condition of the vine and oospores may be found in a hollow pith region as early as mid-June.—*O. A. Stevens.*

896. Schreiner, E. J. **Preliminary survey of Hypoxylon poplar canker in Oxford County, Maine.** Mycologia 17: 218–220. 1925.—*Populus tremuloides* showed less infection with *Hypoxylon* and other cankers when growing in forest stands than when growing in the open. The cankers are principally in the upper part of the trees in forest stands, and near the base of the trees in the open. *P. tacamahacca* seemed to be immune to *Hypoxylon.*—*G. R. Bisby.*

897. Smith, Ralph E., and Elizabeth Smith. **Further studies on Pythiaceous infection of deciduous fruit trees in California.** Phytopathology 15: 389–404. *Fig. 1–6.* 1925.—During the last 10 years a study of crown and trunk cankers of nursery and orchard trees in California has yielded several fungous parasites more or less closely resembling *Pythiacystis citrophthora* Smith and Smith. The pathology and morphology of 5 of these forms have been studied. They are all active wound parasites. Morphologically they show all gradations between the genera *Pythium* and *Phytophthora*. The genus *Pythiacystis* was founded by the present authors in 1906, distinguished from *Pythium* by the type of zoospore formation and from *Phytophthora* by its character as a soil inhabiting saprophyte. The forms reported

in the present paper, as well as other species of *Pythium* and of *Phytophthora* described since 1906, show that these characters are common to species referred to both the latter genera. There is, therefore, no distinguishing character separating these genera as now understood; but the combining of the 3 genera is considered unwise until a thorough study of the entire group can be made.—*B. B. Higgins.*

898. Stanton, T. R., D. E. Stephens, and E. F. Gaines. **Markton, an oat variety immune from covered smut.** U. S. Dept. Agric. Dept. Circ. 324. *1–8. Fig. 1.* 1924.—Although most of the varieties of Red Rustproof oats (*Avena byzantina*) show resistance to loose and covered smuts, yet no satisfactory varieties of common oats (*Avena sativa*) were known that were highly resistant or immune to these smuts. The Markton is the first variety of common oats with high yielding ability and fairly satisfactory kernel characters that has been found to show complete immunity from covered smut. The Markton is a selection from an unnamed variety of oats made at Sherman County Branch Station, Moro, Oregon, in 1911. The original oats came from the Louisiana Purchase Exposition in 1904, from a sample said to have been received from Turkey.—*L. R. Hesler.*

899. Throssell, Gerald L. **A simple dry pickler.** Jour. Dept. Agric. Western Australia 2nd Ser. 2: 20–21. *1 fig.* 1925.—A simple home made device for applying the copper carbonate treatment for smut is described.—*P. J. Olson.*

900. Uphof, J. C. Th. **Das Verhalten von Pucciniopsis caricae Earle auf der Papaya (Carica papaya) in Florida.** [Pucciniopsis caricae Earle, on Carica papaya in Florida.] Zeitschr. Pflanzenkrankh. 35: 118–122. *2 fig.* 1925.—Observations made in Florida are recorded.—*H. T. Güssow.*

901. Walker, J. C. **Control of mycelial neck rot of onion by artificial curing.** Jour. Agric. Res. 30: 365–373. *Pl. 1–2.* 1925.—The paper is concerned with a study of the conditions affecting the occurrence of mycelial neck rot of onion (*Botrytis* sp.) and means for its control. Two other types of neck rot caused by distinct species of *Botrytis* (*B. allii* Munn and *B.* sp.) are mentioned but are not included in the experiments. The amount of infection was found to be greater in bulbs in which the tops were still succulent when cut off at harvest time as compared with those in which the tops were completely dried down when removed. In the case of colored varieties the removal of tops as compared with allowing them to remain intact after harvest usually resulted in a greater percentage of infected bulbs. In the 1 experiment with White Globe variety there was little difference to be noted. The artificial curing of bulbs, sufficiently to cause thorough desiccation of the neck tissue within 2–3 weeks after harvest, resulted in all cases in a material reduction in the amount of disease. This treatment promises to become an effective control measure provided it can be adapted to commercial use at a reasonable cost.—*Author.*

902. Ware, W. M. **Occurrence in England of the winter stage (Venturia inaequalis) of the apple scab fungus.** Gard. Chron. [London] Ser. III. 75: 190–191. *Fig. 79–83.* 1924.—The summer stage of this fungus is a *Fusicladium* and the winter stage, now first reported from England, is described and figured.—*P. L. Ricker.*

903. Weiss, Freeman, C. R. Orton, and R. C. Hartman. **Investigations of potato wart.** U. S. Dept. Agric. Dept. Bull. 1156. *1–21. Pl. 1–4, fig. 1–3.* 1923.—A number of American varieties of potatoes have proved to be immune to wart (*Synchytrium endobioticum*). These include all members tested of the Cobbler, Burbank, Green Mountain and McCormick types, Spaulding Rose, Ehnola, Dakota Red and Keeper. The varieties Triumph, Early Ohio, Early Rose, Pearl, American Giant, Up-to-Date and Rural New Yorker are susceptible in varying degree. A number of commercial varieties of tomato are susceptible to wart, but no other solanaceous plants of horticultural importance have yet been infected. The Spaulding Rose potato proved well adapted to cultivation and the requirements of quarantine administration in the infested areas of Pennsylvania, a gain in potato production going far to offset the cost of the quarantine having been realized from the introduction of high grade immune seed. Immunity to wart is constant in the presence of environmental factors unfavorable to potato culture and of degeneration diseases.—*F. Weiss.*

904. Wiltshire, S. P. **Canker infection of apple trees through scab wounds.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1922: 71–73. 1922.—The scab fungus infects

the shoots of susceptible varieties in England during the autumn and winter following their growth. In the spring most of the pustules are surrounded by a cork layer and are eventually excluded from the tree, only a slight roughness of the bark indicating where they have been. Sometimes, however, the canker fungus (*Nectria galligena*) enters the scab pustules before cork formation and the pustule then soon shows signs of blackening. Later there is a slightly sunken, killed, blackened, area about 5 mm. in diameter, and still later a well defined crack may appear around the infected area, provided the tree is rather vigorous. However, with less vigorous shoots the entire cortex may become infected and the fungus may reach the woody tissue. Experimental evidence for the view here set forth is cited and reference given to a more detailed report (see Bot. Absts. 14, Entry 1705).—*W. H. Chandler.*

905. Wiltshire, S. P. **Canker control trials.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1922: 74.** 1922.—A preliminary report on spraying experiments to control canker (*Nectria galligena*). The evidence is inconclusive but suggests that spraying in March or in November may not be an economical means of controlling the disease.—*W. H. Chandler.*

906. Woolman, Horace M., and Harry B. Humphrey. **Studies in the physiology and control of bunt, or stinking smut, of wheat.** U. S. Dept. Agric. Dept. Bull. 1239. *1–29. Pl. 1–5, fig. 1–3.* 1924.—The authors here record the results of experiments which prove that in the region comprising eastern Washington and Oregon and northern Idaho, bunt or stinking smut of wheat in recurrent epidemic proportions is due commonly to showers of smut spores which are precipitated on the fallow land during threshing. In the region referred to, summer fallowing is a general practice. When wheat is sown on these lands bunt infection almost certainly follows in spite of the most approved methods of seed treatment. Bunt spores were found to retain their viability at least 12 years under herbarium conditions. Bunt heads collected subsequently to the 1913 harvest and stored in a barn until October, 1914, were then buried in open ground at a depth of 8 inches. Part of these remained intact until May 1, 1916. The spores from these heads, used as inoculum, produced a small percentage of infection in spring wheat. The authors proved by experiment that the minimum, optimum, and maximum temperatures for spore germination are, respectively, 0 to 1°, 18–20°, and 25–29°C. A soil temperature of approximately 20° is sufficient practically to immunize wheat against infection. The infecting hyphae of the bunt fungus may enter the wheat seedling at any point along the coleoptile, and infection may obtain even after the plant has produced its first leaf. The authors conducted an extensive study of varietal resistance of wheat to bunt and found that the degree of susceptibility is not determined by vigor and rapidity of growth nor by early ripening. In the Pacific Northwest, where soil infestation commonly obtains, bunt may be wholly prevented by sowing treated seed prior to the smut shower. It can be controlled by delaying seeding until the saprophytic existence of the organism has terminated.—*Harry B. Humphrey.*

907. Woolman, Horace M., and Harry B. Humphrey. **Summary of literature on bunt, or stinking smut, of wheat.** U. S. Dept. Agric. Dept. Bull. 1210. *1–44.* 1924.—In reviewing the literature on bunt or stinking smut of wheat, the authors present their data in 3 historical periods: the pre-Tillet period (500 B.C.–1755 A.D.); the Tillet-to-Kühn period (1755–1870); and the Kühn or modern period (1870 to date). Down to the time of Tillet (1755) bunt was believed to be caused by environmental factors or by intervention of Divine Providence. In 1755, Tillet demonstrated by experiment its infective nature. It remained for Prévost to establish in 1807 the fact that bunt was caused by a fungus. The use of copper sulphate as a bunt fungicide was first suggested by Schulthess in 1761. The use of formaldehyde as a seed disinfectant was suggested by Th. Geuther as early as 1895 and Bolley in 1896 was the first American plant pathologist to recommend its use as a bunt preventive. Appel, in 1913, reported the occurrence of bunt in wheat, caused by spores blown from a threshing machine. —*Harry B. Humphrey.*

908. Zeller, S. M., and Leroy Childs. **Perennial canker of apple trees.** Oregon Agric. Exp. Sta. Bull. 217. *1–17. Fig. 1–23.* 1925.—This is apparently an undescribed apple disease which until recently had been confused with the northwestern apple-tree anthracnose caused by *Neofabraea malicorticis*. The known range of the disease extends from the Okanogan Valley, British Columbia to the Willamette Valley, Oregon, and as far east as Hood River,

Oregon, and Spokane, Washington. It differs from the anthracnose disease in at least 4 particulars: (1) It is perennial in character, (2) it is a distinct wound parasite whereas anthracnose usually attacks in the absence of wounds, (3) the morphology of the conidia is distinct, and (4) it reacts differently in culture media. The name *Gloeosporium perennans* Zeller and Childs n. sp. is proposed for the fungus and "perennial canker" is given as a common name.—Control measures are not definitely worked out but probably Bordeaux sprays, together with care in pruning to avoid large wounds, and cutting out diseased tissues followed by an antiseptic wound dressing, will be beneficial.—*C. E. Owens.*

DISEASES CAUSED BY BACTERIA

909. Coons, G. H., and J. E. Kotila. **The transmissible lytic principle (bacteriophage) in relation to plant pathogens.** Phytopathology 15: 357-370. *Pl. 9-12.* 1925.—A portion of a partly decayed (typical soft rot) carrot (*Daucus carota* L.) was placed in a flask with 25 cc. of standard beef broth and incubated for 24 hours. The resultant liquid was then filtered through paper and finally through a Pasteur bougie, giving an apparently sterile filtrate. When 1 drop, 10 drops, and 2 cc. of this filtrate were added to tubes of alkaline (pH 8.0) broth inoculated with *Bacillus carotovorus* a distinct inhibition of growth of this organism occurred. Subsequent filtrates were obtained by filtering broth cultures of *B. carotovorus* to which the lytic principle had been added. The potency of the lytic principle was increased by repeated culture in association with *B. carotovorus* and filtering after each passage. After the 8th passage the filtrate showed inhibitory effect in dilutions of 1–100,000,000 and definite lysis (clearing of solutions already clouded by bacterial growth) in higher concentrations. In hanging drop cultures to which active lytic filtrate had been added the bacteria showed loss of motility and agglutination immediately and malformations after 24 hours. The lytic principle was active against *Bacillus carotovorus, B. atrosepticus,* and *Bacterium tumefaciens;* slightly active against *B. amylovorus* and *B. typhosus;* but inactive against *B. dysenteriae, Bact. pullorum* and *Bact. sanguinarium.* Apparently the same lytic principle was obtained from river water and from soil which had been drenched with suspensions of *B. atrosepticus.* Aseptically prepared cubes of carrot and potato, smeared with a loop drop of active filtrate and inoculated with *B. carotovorus* and *B. atrosepticus,* respectively, were protected from infection.—*B. B. Higgins.*

910. Gäumann, Ernst. **Über zwei Bananenkrankheiten in Niederländisch Indien. [Two banana diseases of Dutch India.]** Zeitschr. Pflanzenkrankh. 33: 1-17. *6 fig.* 1923.—The author discusses 2 new diseases affecting bananas in the Dutch Indies, namely, a disease of the vascular bundles of bananas of Java and all the Dutch Indies, while the 2nd, termed "Blutkrankheit" (blood disease), seems to be endemic only in South Celebes and adjacent islands.—The former is due to *Pseudomonas musae* n.s. ad int., which is a true parasite of the vascular bundles. All varieties of bananas of Java (14 species and 77 varieties) are susceptible in varying degrees. Related genera like *Ravenala, Strelitzia,* and perhaps some species of *Heliconia,* are equally attacked. Control measures have not been finally determined.—The "Blutkrankheit," which shows diverse symptoms, and which derives its name from the reddish discoloration especially of the fruit, is due to another species of *Pseudomonas,* to which the name *P. celebensis* has been given. All varieties known in Celebes and hundreds of others introduced from Java are equally susceptible; hence the search for immune varieties is not promising. Suggestions relating to control are being made.—*H. T. Güssow.*

911. Johnson, James, and Herbert F. Murwin. **Experiments on the control of wildfire of tobacco.** Wisconsin Agric. Exp. Sta. Res. Bull. 62. *1-34. Pl. 1-7.* 1925.—Overwintering, dissemination, and seed disinfection are discussed in most detail. Some experimental work on dusting and spraying, loss of virulence, and the bacterial toxin are also presented, followed by a consideration of practical control measures. It is concluded that the wildfire organism lives over winter most readily in the dry condition. Dusting and spraying were not found to be satisfactory control measures. Seed disinfection with silver nitrate is recommended in preference to other seed treatments.—*R. E. Vaughan.*

912. Smith, E. F. **Les maladies bactériennes des plantes. [Bacterial diseases of plants.]** Rev. Path. Vég. et Entomol. Agric. 12: 82-92. 1924.—A general discussion is given of the significance of bacteria as related to plant diseases.—*J. Dufrenoy.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

913. Alden, Charles H. **San Jose Scale control with lubricating oil emulsion on peach trees in the south.** Jour. Econ. Entomol. **18**: 253–257. 1925.—The San Jose scale (*Aspidiotus perniciosus*) has been gradually increasing on peach trees in the south in spite of annual dormant treatments with lime-sulphur. During the years 1922, 1923, and 1924, lubricating oil emulsions were compared with the standard lime-sulphur for scale control and tree injury. A 2% lubricating oil emulsion made from either the boiled or cold formulae gave excellent scale control and caused no tree injury, even when twice used in one dormant season. Lime-sulphur gave poor control and caused some twig injury. Trees incrusted and covered with crawlers require 2 dormant applications of 2% emulsion for effective control, while under similar conditions lime-sulphur applied twice was ineffective. Summer treatments with oil emulsions caused premature defoliation and were less effective than winter treatments.—*Author's abstract.*

914. Ballard, E., and G. S. Peren. **Red plant in strawberries and its correlation with "cauliflower disease."** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1923**: 83–87. 1923.—Red Plant is a disease which, though recognized by some growers for a number of years, has only recently come to be of any considerable importance. The petioles are long and generally deep red. The leaves are red, often imperfectly formed and frond-like. The crowns are generally small, often with few or no lateral crowns. In advanced stages the lateral crown becomes much swollen and the flowers stunted and distorted into a cauliflower-like bunch. It is caused by the organism *Aphelenchus fragariae*. The authors seemed to find gradations from the "red plants" to the most pronounced cases of "cauliflower disease" and they think that these 2 diseases and "small leaf" may be due to the same organism.—*W. H. Chandler.*

915. Briton-Jones, H. R. **The purple leaf blotch of strawberry.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1923**: 88. *7 fig.* 1923.—A description with illustrations of an injury caused by aphis (*Myzus fragariella*).—*W. H. Chandler.*

916. Brooks, Fred E. **Curculios that attack the young fruits and shoots of walnut and hickory.** U. S. Dept. Agric. Dept. Bull. 1066. *1–16. Pl. 1–8.* 1922.—This paper describes 4 species of snout beetles of the genus *Conotrachelus* which attack the immature fruits and tender shoots of walnut and hickory, and which are discussed in detail.—The species attacking butternuts, black walnuts and hickory nuts frequently cause a heavy dropping of the nuts, materially reducing the crop. Studies of these species were conducted principally in West Virginia, but all occur, at least locally, over a considerable part of the eastern U. S. A. These curculios are held in check to some extent by certain parasitic flies, and hymenopterous parasites, which are named. Gathering and destroying the fallen nuts while the larvae are yet within them and spraying of infested trees with arsenical poisons are recommended as remedial measures.—*Author.*

917. Cook, William C. **The distribution of the alfalfa weevil (Phytonomus posticus Gyll.). A study in physical ecology.** Jour. Agric. Res. **30**: 479–491. *Fig. 1–12.* 1925.—In this paper a study is made of the climatic conditions under which *Phytonomus posticus* is abundant and destructive in Europe and Asia. The optimum and limiting conditions are determined, and the regions in the U. S. A. having similar conditions are indicated. This study shows that the conditions most favorable for the weevil are found in the Great Basin, Columbia River Basin, and Pacific Slope states, with areas of less favorable conditions along the eastern slope of the Rockies. While the weevil may spread to other parts of the country, it seems probable that it will be a pest of very minor importance elsewhere.—*Author.*

918. Corbett, G. H., and D. Ponniah. **"Red stripe" weevil of coconuts, Rhynchophorus schach Oliv.** Dept. Agric. Straits Settlements and Federated Malay States Bull. 36. *1–51. Pl. 1–6 (2 col.).* 1924.—The bulletin gives the distribution and life history of the weevil with description of injury to the coconut, and relation to the black beetle. Some undetermined points in the life history were settled by careful observations.—*L. C. Cash.*

919. Cordemoy, H. J. de. **Sur une acrocécidie nouvelle d'un Psiadia de Madagascar. [A new acrocecidium caused by a Psiadia of Madagascar.]** Rev. Gén. Bot. **37**: 289–302. 1925.

—The gall of *Psiadia altissima* is a deformation of the terminal bud of the branch; it is a cauline acrocecidium as well as an acarocecidium if it is admitted that an Eriophyide causes this pathological condition. It presents a globose mass at the tip of the branch, resembling an artichoke in form. The axis is made up of a series of thickened internodes, swollen because of a considerable hyperplasia of the cortex as well as being very spongy. The leaves inserted on this axis enclose one another like the bracts of a head, being profoundly modified in form and structure, completely deprived of chlorophyll and covered with an abnormal coat of hairs.—*J. C. Gilman.*

920. Godfrey, G. H., and M. B. McKay. **The stem nematode Tylenchus dipsaci on wild hosts in the Northwest.** U. S. Dept. Agric. Dept. Bull. 1229. *1–8. Pl. 1–3, fig. 1.* 1924.—The stem nematode (*Tylenchus dipsaci*) has been found rather abundantly in the Pacific Northwest on the wild strawberry (*Fragaria chiloensis*) and on the false dandelion (*Hypochaeris radicata*).—The wild strawberry strain of nemas occurs along the west coast of Oregon near the seashore, from Coos County to Northern Tillamook County. The Hypochaeris strain was found from the southern part of Lincoln County, Oregon, to Long Beach, Washington, being almost universally present in Western Oregon.—Judging from natural occurrence, the 2 strains appear to be entirely independent of each other.—The symptoms of the disease on either host are swelling and crinkling of the leaves and stems, in extreme cases resulting in marked twisting and bending. Where an abundance of infection is present in the crowns, the plants are often killed. In strawberry plants the stolons and the flowering parts are also swollen and distorted.—Several species of *Fragaria* are capable of becoming infested. The strawberry strain can be transmitted to red clover seedlings. Attempts to transmit the Hypochaeris strain to other hosts have thus far failed.—*Authors' summary.*

921. Groff, G. W., and C. W. Howard. **The cultured citrus ant of South China.** Lingnaam Agric. Rev. 2^2: 108–115. *Fig. 1–3.* 1925.—The authors present data secured from experiments, the object of which was to determine the relationship of the red ant, *Oecophylla smaragdina*, to the control of many harmful insects on citrus trees. Surveys indicated that the citrus growers of many sections of Kwangtung Province have for many years cultured this ant in their citrus trees and were firmly convinced that without this ant they could not secure a crop of fruit. The special insects which were claimed to be kept under control by these ants were stink bugs (*Tesseratoma papillosa*), borers and other insects feeding on the flowers and fruit. The results of observations and experiments showed that (1) the red ant attacks and either kills or drives away caterpillars and other large insects which come to feed on the trees. They also attack man when teased. (2) They do not destroy scale insects which are serious enemies of citrus trees; and (3) they sometimes but not always destroy plant lice which are serious enemies of citrus trees. The conclusion is that the real economic value of the red ant is questionable.—*R. H. Porter.*

922. Hadley, C. H. **The Japanese beetle in Pennsylvania.** Pennsylvania Dept. Agric. Gen. Bull. 390. *1–19. 6 fig.* (insert 1 p. *fig. 1*). 1924.—The occurrence, spread and life history of the Japanese beetle, *Papillia Japonica* Newm., are briefly presented. The list of economic plants most vigorously attacked numbers 29, while over 200 species of plants are known to be attacked in varying degree. Arsenate of lead, flour, and water are recommended for control. These materials in various proportions are applied as a spray on apples, peaches and cherries. On grapes the common Bordeaux mixture is used, with a slightly increased arsenate content.—*H. W. Thurston, Jr.*

923. Hartzell, Albert, and F. H. Lathrop. **An investigation of sulfur as an insecticide** Jour. Econ. Entomol. **18**: 267–279. 1925.—The toxicity of sulphur and some of its compounds was tested under laboratory and field conditions. Atmospheres containing the volatile products of lime-sulphur were found to produce lethal effects on San Jose scale (*Aspidiotus perniciosus*), especially on the young. Tests on the covers of this species indicate that they are very slightly if at all soluble in lime-sulphur and in the common wax solvents such as benzene, xylene and turpentine. Three new sulphur insecticides were invented during the progress of this investigation: (1) Carbon disulphide-sulphur emulsion was made by emulsifying soap and water with carbon disulphide containing dissolved sulphur. Promising results were obtained with this preparation in the control of pear psylla (*Psylla pyri*) and as a dor-

mant spray for San Jose scale. (2) Sulphur-naphthalene dust was prepared by dissolving flowers of sulphur in melted naphthalene, then rapidly chilling the solution and grinding the solid thus formed into a dust by means of a ball mill. As a greenhouse insecticide this dust has proved effective against red spider (*Tetranychus* sp.) and aphids. (3) A colloidal sulphur was prepared by passing sulphur fumes into a dispersion medium, such as soap and water or glue and water. This method of manufacture has an advantage in that it obviates the necessity of changing the sulphur to some other form and recovering it again by chemical means. Field tests indicate that this preparation compares favorably with other colloidal sulphurs in the control of insects and apple scab.—*Authors' abstract.*

924. Horsfall, J. L. **Life history studies of Myzus persicae Sulzer.** Pennsylvania Agric. Exp. Sta. Bull. 185. *1–16.* 1924.—The author lists 106 different hosts of this aphid in the U. S. A., together with detailed life history studies extending over a period of 3 years. —*H. W. Thurston, Jr.*

925. Horsfall, J. L. **The control of plant lice on vegetables.** Pennsylvania Agric. Exp. Sta. Bull. 186. *1–16. 5 fig.* 1924.—The bulletin describes experiments on the control of *Myzus persicae* and *Aphis pseudobrassicae.* These species are said to be controlled effectively by 40% nicotine sulphate, diluted 1–500 with water, and containing 5 pounds of soap per 100 gallons of solution. Nicotine dusts are also said to provide satisfactory control but are more expensive unless home mixed.—*H. W. Thurston, Jr.*

926. Lees, A. H. **A note on the effect of sulphur on black currant mite.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1923:** 80–82. 1923.—Lime sulphur spraying to control the currant mite ("big bud") has sometimes been disappointing and sometimes promising. Since the mites migrate slowly and the evolution of sulphuretted hydrogen lasts only a short time after the spray, it was thought that any control effected must be from the finely divided sulphur. A deposit of sulphur from a sulphur cloud on the inner side of a bell jar, a washed and dried deposit of lime-sulphur on the inner side of a bell jar, and a coating of sulphur from a cloud on a "big bud" twig, were all effective for 10 or more days in killing emerging mites. This suggests that spraying will be highly effective only if the active sulphur can be kept on the twigs throughout the time the mites are migrating. However, lime sulphur can be used in a 2nd application only at summer strength, for the canes are then appearing. Furthermore, the sulphur is then deposited mainly on the leaves. Trials did not indicate that such 2nd or 3rd sprayings at summer strength appreciably increased the effectiveness of control.—*W. H. Chandler.*

927. Lees, A. H. **Egg-killing washes.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1922:** 58–61. 1922.—This study was made on eggs of *Aphis pomi* on apple twigs. The substances tried were proprietary fluids (A and B), lime sulphur, red oil, paraffin emulsion, mercuric chloride and various mixtures of caustic soda and nicotine. Trials were made from the middle of January to the middle of April. The treatment was painted on 4-inch sections of branches. Lime sulphur, caustic soda with nicotine and fluids A and B, seemed rather effective in killing eggs. Slightly better results seemed to be obtained with the March applications. Lime sulphur seemed to be about equally effective at strengths of 1:10, 1:12, 1:15 and 1:20. The effectiveness of caustic soda and nicotine seemed to be slightly increased with increasing concentration up to 2% caustic soda and 0.1% nicotine.—*W. H. Chandler.*

928. Lees, A. H. **Egg-killing washes.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1923:** 75–79. 1923.—A continuation of work on eggs of *Aphis pomi* (see preceding entry). Lime sulphur alone at all strengths was effective in killing; combined with 0.2% calcium caseinate it had a strong killing action at strengths of 1:15, 1:20 and 1:30, whether used in February or March. Other fluids releasing finely divided sulphur or sulphur dioxide were comparatively ineffective. Combinations of caustic soda and nicotine were very effective if applied just before hatching but were useless at earlier dates. Certain coal tar products were rather effective but most of them were not; some were very injurious to the plants.—*W. H. Chandler.*

929. Marcovitch, S. **The strawberry root louse in Tennessee.** Jour. Agric. Res. **30:** 441–449. *Pl. 1–3.* 1925.—Experimental work with *Aphis forbesi* showed that infested plants produced an average of 47.6 runners as compared with 49.7 by the controls. This would indicate that this insect is not of great economic importance in Tennessee. The appearance

of the true sexes was found to be influenced by the relative length of exposure to daily light. Details are given.—*Author.*

930. Menzies, W. J. M. **Fish poisons as insecticides.** Nature **116**: 315. 1925.—The use of *Euphorbia hibernica* in southern Ireland is noted.—*O. A. Stevens.*

931. Miles, Herbert W. **The apple blossom weevil: its life-history and control.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1922**: 49–52. 1922.—Information is given concerning the life history, behavior and natural enemies of the insect; and preliminary notes are given concerning control measures. Of the many substances tried as sprays, only one—composed of potash soft soap 0.5%; paraffin 10% and soft water 89.5%—was considered worthy of trial in a grower's plantation.—*W. H. Chandler.*

932. Miles, Herbert W. **The apple blossom weevil.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1923**: 58–61. *Fig. 1–6.* 1923.—The author discusses the habits and life history of the apple blossom weevil (*Anthonomus pomorum*). Methods of control that have been tried are jarring them from the trees into tarred sheets; trapping the adult insects with bands of paper or sacking on the trunk, as they come up from winter quarters; placing such bands around the trees in mid-summer so that the insects will go into winter quarters under them and can be destroyed; scraping the trunks in February and spraying with paraffin emulsion; and collecting the infested blossoms early in May. Individual orchardists alone can not control this insect very effectively; it generally requires community action.—*W. H. Chandler.*

933. Peren, G. S. **Spraying for the control of the logan beetle.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1922**: 62–66. 1922.—Spraying with arsenate of lead seemed to control the logan beetle effectively if 3 sprayings were given, one when the blossoms were ⅓ open, one when they were ⅔ open and one when they were fully open. Paraffin emulsion showed some measure of control but sometimes caused severe burning of the foliage.—*W. H. Chandler.*

934. Sonan, Jinhaku. **Insect pests of the tea-plant in Formosa. Part 1.** Rept. Dept. Agric. Govt. Res. Inst. Formosa, Japan 12. *3 + 1–132. 3 pl. (col.), 2 fig.* 1924.—The text is in Japanese; scientific names are in Roman type.—*Frederick V. Rand.*

935. Tattersfield, F. **Fish poisons as insecticides.** Nature **116**: 243. 1925.—Species of *Derris* and *Tephrosia* give promise of usefulness as a source of insecticides. Plants used as fish poisons and belonging to groups other than Leguminosae have not proved of interest.—*O. A. Stevens.*

936. Watson, J. R. **Report of the Entomologist.** Florida Agric. Exp. Sta. Ann. Rept. **1924**: 76R–83R. 1924.—In regard to the attempt to substitute calcium cyanide for the double application of sodium cyanide and ammonium sulphate in treating root-knot, it is yet too early to draw conclusions. The new Victoria cowpea proved to be much more heavily attacked by root-knot than the Brabham. *Crotalaria*, used as a cover crop, seems to be immune. Experiments by Trigg showed that an application of 200–500 pounds of sulphur to the acre resulted in a marked diminution in the number of nematodes in the soil and had a stimulating effect upon plant growth.—*J. C. Th. Uphof.*

937. Weimer, J. L., and L. L. Harter. **Varietal resistance of sweet potatoes to nematodes, Heterodera radicicola (Greaf.) Muller, in California.** Phytopathology **15**: 423–426. 1925.—Nematode infestation has been found causing considerable damage to sweet potatoes in parts of California. In order to test the comparative susceptibility of commercial varieties, seed roots of Porto Rico, Big Stem Jersey, Little Stem Jersey, Red Jersey, Southern Queen, Yellow Belmont, Nancy Hall, and Red Brazil were bedded in heavily infested soil. When slips were pulled for planting, a few galls were found on the roots of the Red Brazil variety only. Plants of each variety were then set in infested fields in 3 localities. At digging time no galls were found on the roots of the Red Jersey, Southern Queen, or Yellow Belmont varieties in any of the fields. A few galls were found on plants of the Little Stem Jersey, Big Stem Jersey, and Porto Rico varieties in some of the fields but no material reduction in yield resulted. The Nancy Hall and Red Brazil varieties showed heavy infection in all the fields.—*B. B. Higgins.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

938. Campbell, Elmer Grant. **Potato leaf roll as affecting the carbohydrate, water, and nitrogen content of the host.** Phytopathology **15**: 427–430. *Fig. 1–3.* 1925.—Healthy and leaf-roll diseased seed potatoes of the 3 varieties, Rural New Yorker, Irish Cobbler, and Early Ohio were planted in a greenhouse and grown under similar conditions. Just prior to tuber formation the plants were cut off at the surface of the soil and the entire plant above ground used in determining percentage dry weight, reducing sugars, non-reducing sugars, polysaccharides, and total nitrogen. In all samples the percentage dry weight, all forms of carbohydrates, and the carbon-nitrogen ratio were higher in the leaf-roll plants. Since the plants had not begun to form tubers, it seems that this must be attributed to some cause other than reduced translocation, possibly to a retarded transpiration stream, abnormally stimulated photosynthesis, or to both these factors together.—*B. B. Higgins.*

939. Doolittle, S. P. **Control of cucumber mosaic in the greenhouse.** U. S. Dept. Agric. Dept. Circ. 321. *1–5. Pl. 1–2.* 1924.—The article deals with severity, description, nature, source of virus and control in the greenhouse. The infective principle is not carried over in the soil, in the seed, or in the body of the striped beetle. It does winter over, however, in certain wild plants, particularly in the common wild cucumber (*Micrampelis lobata*), the milkweed (*Asclepias syriaca*), the pokeweed (*Phytolacca decandra*), and the wild ground-cherry (*Physalis* sp.). In the wild cucumber the causal agent is carried over in the seed, though this is not the case for the cultivated cucumber. In other plants listed, it is carried over in the perennial roots. Control is based on removal of wild hosts and the destruction of insects which carry the virus from one plant to another.—*L. R. Hesler.*

940. Gardner, Max W. **Necrosis, hyperplasia, and adhesions in mosaic tomato fruits.** Jour. Agric. Res. **30**: 871–888. *Pl. 1–8, fig. 1.* 1925.—This is a study of the pathological anatomy of greenhouse tomato fruits from plants affected with the severe (streak or winter blight) type of mosaic. Necrotic lesions in very young fruits result in malformation of the fruit, rupture of the fruit wall, and deep cracking of the fruit. Mosaic fruits may show brown necrotic surface patterns, translucent surface blisters, and isolated internal necrotic regions surrounded by translucent zones. Necrotic planes constituting abnormal adhesions frequently occur between the fruit wall and the seed pulp. The surface blisters are caused by cushions of muriform hyperplastic tissue which push up under the necrotic epidermis. The internal necrotic regions are pockets or plates of crushed brown tissue surrounded or accompanied by zones of elongated, hypertrophied cells or zones of parallel columns of meristematic cells growing in toward the necrotic region. Rather well-developed intumescences grow inward from the locular walls and invade the seed pulp, resulting in abnormal tissue fusions or adhesions. Apparently the hypertrophy and hyperplasia are responses to the necrosis.—*Author.*

941. Gardner, Max W., and James B. Kendrick. **Potato leaf roll in Indiana.** Purdue Univ. [Indiana] Agric. Exp. Sta. Bull. 284. *1–23. Fig. 1–7.* 1924.—By means of field plots planted with tubers previously indexed in the greenhouse, tests made during 1921, 1922, and 1923, mainly with the Rural variety, show that, even though leaf roll can not be reliably detected in the field, it causes losses in yield of 22–66%. By the greenhouse index method it was found that much secondary spread of infection occurred in these field plots, more in some regions than in others. Current season infection did not as a rule lower the yield. In the greenhouse tests it was found that a considerable percentage of the recently infected hills produced mixed tuber progenies, that is, some tubers yielded leaf roll and some yielded healthy plants in the greenhouse tests; in such cases it was further found that some of the eyes of the same tuber might produce leaf roll and the rest healthy plants.—*Authors.*

942. Goss, R. W. **Effect of spindle tuber disease on sprouting.** Potato News Bull. **2**: 261–262, 264. 1925.—It has been shown that potatoes affected with spindle tuber sprout late or weakly. Evidence is here presented that spindle tubers which fail to produce a plant form secondary tubers from the seed piece; this tendency is correlated with the severity of the disease. Frequency of secondary tubers was the same within the soil temperature range 15 to 25°C., but was greater at low than at high soil moisture contents. The tendency is greatest

in tubers which have not fully completed their rest period. The presence of spindle tuber infection may be an important cause of poor stands, particularly in early plantings such as are made in the South.—*Freeman Weiss.*

943. Johnson, James. **Transmission of viruses from apparently healthy potatoes.** Wisconsin Agric. Exp. Sta. Res. Bull. 63. *1–12. Pl. 1–8.* 1925.—The summarized results of a number of inoculations are presented to show that when an extract from potato vines or tubers which are healthy as far as can be determined is inoculated into tobacco, symptoms develop which have been shown to belong in the category of virus diseases. These symptoms apparently can be secured from any individual of most, if not all, standard varieties of potatoes. Symptoms of 3 types are described and illustrated: namely, "mottle," "spot-necrosis," and "ring-spot." The 2 former may be different expressions of the same disease since there appears to be good evidence of changes in virulence of the viruses. The viruses have been transmitted to a number of other solanaceous plants as well as to tobacco. The "spot-necrosis" type can be transmitted back to the potato where it produces an especially malignant disease, although loss of virulence of the virus follows repeated transfers through the potato. Whether or not this disease on potato is identical with any disease previously described has not been determined. No other species of healthy plant has yet been found which will behave like the potato in this respect. Potatoes from true seed also failed to give the symptoms on tobacco. The effect of a combination of the viruses with tobacco mosaic is briefly described. Results from these experiments seem to indicate that potatoes are generally infested with viruses which are not harmful to the potato or that the protoplasm of the potato may actually be the causal agency of the diseases in question. Further evidence must be secured to establish either of these hypotheses.—*R. E. Vaughan.*

944. Storey, H. H., and A. M. Bottomley. **Transmission of a rosette disease of the ground nut.** Nature **116**: 97–98. 1925.—This disease of *Arachis hypogea* has caused considerable loss in South Africa. The writers believe it identical with the East African "Krauselkrankheit" of Zimmerman and the Javan "Krulziekte" of Rutgers, and with the "bunching" or "clumping" recorded from West Africa and India. Work at Pretoria and Durban has demonstrated transmission by *Aphis leguminosae* Theo. Tests with over 200 specimens of other suctorial insects (8 species of fulgorids and jassids) were negative.—*O. A. Stevens.*

NON-PARASITIC DISEASES

945. Baker, Clarence E. The use of oiled wraps in the prevention of storage troubles. Trans. Indiana Hort. Soc. **1923**: 80–84. 1924.—Tests with the apple variety Grimes, at Bedford, Indiana, in 1923 showed that shredded oiled paper scattered through the pack was almost as effective in scald prevention as the wrappers and was sufficiently less expensive to be practicable under Indiana conditions. Grimes apples picked ripe and held for 20 days before storage scalded much more severely than similar fruit placed at once in cold storage.—*Author.*

946. Eubel, L. **Bittere Gurken. [Bitter cucumbers.]** Gartenwelt **28**: 84. 1924.—Many cucumbers, especially those that are forced in the greenhouse, turn bitter. This is due to the fact that the activity of the leaves has decreased. Causes are exposure of stems and leaves to cold against the glass roof, strong exposure to the sun's rays, decided withering of the leaves, very heavy manuring, and removal of a large number of leaves.—*J. C. Th. Uphof.*

947. Hartman, Henry. **The control of core break-down in pears.** Oregon Agric. Exp. Sta. Bull. 216. *1–16. 2 fig.* 1925.—Core break-down is a physiological disease which may be confined to the region of the seed cavity or may extend to the entire core and surrounding portions of the torus. At first the disease is characterized by a soft, watery condition and later by a brownish or black discoloration, usually accompanied by a foul odor.—Core break-down seems to be related to time of picking. The disease develops only in fruit harvested after its best picking time; it can probably be controlled by picking at the proper time. Storage does not seem to influence the development of the disease.—The pressure tester (described in Oregon Sta. Bull. 186) is the best method available for determining the proper time to pick pears in order to avoid core break-down. The following pressure ranges generally control this trouble: Bartlett, 35 to 25 pounds; Comice, 20 to 18 pounds; Anjou, 24 to 19 pounds; Winter Nelis, 28

to 24 pounds; Willamette Valley Bosc, 30 to 27 pounds; and Rogue River Bosc, 24 to 20 pounds. —*C. E. Owens.*

948. Summers, F. **The physiology of leaf scorch.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1922**: 75–83. 1922.—A review of some of the literature bearing upon the subject and a report upon experiments with apple shoots. With a ringed shoot it was possible to cause evaporation from the ringed surface to be so rapid as almost entirely to shut off the water supply to the portion of the shoot above. In a greenhouse where the shade temperature was 80°F. and the humidity 50%, ringing a shoot would cause the appearance of scorch on the 2nd day. There was no intermediate wilting. From his experience and from the literature reviewed the author thinks that the characteristic browning of "scorched" leaves is an after-effect which may appear after the conditions responsible for the scorching have passed, the primary effect being the destruction of green pigments in the leaf and the drying out of the cells; the browning is probably due to the action of oxidizing enzymes on the chromogens produced during the drying out of the leaves, the action taking place as soon as the leaf re-absorbs moisture from the air; the drying out of the leaf is caused by a sudden discontinuation of the transpiration stream in the leaf, not in the conducting system of the shoot; it seems to have been shown that potash starvation may lead to leaf scorching, but the relation is not clear (see also Bot. Absts. 13, Entry 345).—*W. H. Chandler.*

949. Wallace, T. **Experiments on chlorosis—with special reference to cases at Winscombe, Somerset.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1922**: 84–92. 1922.—(See Bot. Absts. 13, Entry 346.)

950. Young, H. C., and R. C. Walton. **Spray injury to apple.** Phytopathology **15**: 405–415. *Pl. 14, fig. 1.* 1925.—During the summer of 1923 spray injury to apple foliage and fruit was especially severe in New York and Pennsylvania. A study was made of the various types of injury associated with the use of sulphur sprays and dusts; and an effort was made, by comparing the effects of various sprays and dusts, to determine the cause of the different types of injury. The fungicides used were lime-sulphur, lime-sulphur plus casein, lime-sulphur plus glue, sublimed sulphur plus casein, precipitated sulphur, colloidal sulphur, and lime-sulphur, 90–10, dust. The injuries noted were classified under 7 types, as follows: (1) Edge burn is produced by lime-sulphur and to a less extent by colloidal sulphur and precipitated sulphur; it does not appear to be correlated with high temperature. (2) Scald occurs on both leaves and fruit following applications of sulphur sprays or dusts in extremely hot weather. (3) Yellow leaf may follow the use of all sulphur sprays in midseason; the leaves turn yellow and drop off. (4) Goose neck is sometimes caused by spray injury to the midrib of the leaf but is often due to other causes. (5) Injury following apple scab may be due to the penetration of spray material through tissues killed by apple scab, but the exact cause is still uncertain. (6) Leaf roll is also of uncertain origin. (7) Fruit russeting, generally associated with the use of copper fungicides, is also produced by lime sulphur sprays.—*B. B. Higgins.*

DISEASES OF UNKNOWN CAUSE

951. Lees, A. H. **Statistical studies on the propagation of big bud and reversion disease of black currants.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1922**: 53–57. 1922. —The plantation studied was composed of about 550 plants of the varieties Edina, Boskoop Giant, Seabrook's Black and Baldwin. It was thought that the amount of reversion appearing early during the first summer might represent the amount a grower could expect to encounter when he received his plants from the best nurserymen. The percentage of reverted plants showing early during the first summer varied from nothing with Seabrook to 20% with Edina. Tables are given showing the relation of "big bud" to reversion, and other tables showing the susceptibility of different varieties to "big bud." Edina was found strikingly more susceptible than the others.—*W. H. Chandler.*

952. Lees, A. H. **Progress report on big bud and reversion of black currants.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1923**: 69–72. 1923.—A continuation of work described in the report for 1922 (see preceding entry), for a planting of 545 black currant bushes. The number of new infections of reversion has decreased each year and there is no

evidence that reverted bushes act as sources of infection. Removal of "big buds" in winter considerably reduced the infestation of "big bud" in the following year, even with badly infested plants. Bushes with mild infestations of "big bud" show no appreciable reduction of crop.—*W. H. Chandler.*

953. Ridler, Winifred F. F. **The structure of reverted black currants.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. **1923:** 73–74. 1923.—The most striking differences observed in the reverted plants is a reduction in the amount of vascular tissue and a consequent increase in the relative amount of medullary ray tissue to the plants. The amount of vascular tissue is also greatly reduced in the fruit. In the reverted plants there is produced a gummy substance that often completely blocks the conducting tissue.—*W. H. Chandler.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE.

954. Anonymous. **Symposium, inspection methods in various states.** Jour. Econ. Entomol. **18:** 455–467. 1925.

955. Berly, J. A. **Home made, steam boiled, lime sulphur wash.** South Carolina Agric. Exp. Sta. Circ. 30. *1–3. 1 fig.* 1918.—Directions for making this wash are given.—*C. A. Ludwig.*

956. Briton-Jones, Harry R. **Mycological work in Egypt during the period 1920–1922.** Ministry Agric. Egypt. Tech. & Sci. Serv. Bull. 49. *1–129. 11 pl. (in part col.).* 1925.—About half of the bulletin is devoted to sore shin of cotton, due to *Rhizoctonia crocorum* (Pers.) D.C. The disease, and its causal organism are discussed as well as its identification, isolation, infection experiments, other hosts and conditions affecting its growth in laboratory and field. Naphthaline treatment as recommended by Balls was found to be of doubtful economic value. The use of lime was also found to give little or no results. Numerous recommendations are given for the control of the disease in Egypt.—Other diseases discussed are root rot of cotton, found to be due to *Rhizoctonia batiticola*, other minor diseases of cotton, and the more common diseases of legumes, cereals and vegetables.—*W. Carlton McQuiston.*

957. Bunting, R. H., and H. A. Dade. **Gold Coast plant diseases.** *124 p. Pl. 1–21 + 4 col. pl.* Waterlow & Sons: London, (1925?).—After a general discussion of disease, the diseases of specific crops are treated, those of cocoa in greatest detail. Among the other crops considered are coffee, cola, Para rubber, citrus and palms. The plants (injurious pests) ordinance of 1923 and a list of the local fungi are included.—*L. C. Cash.*

958. Burger, O. F. **Report of Plant Pathologist.** Florida Agric. Exp. Sta. Ann. Rept. **1924:** 84R–113R. 1924.—Isolations of pecan scab (*Fusicladium effusum*) were made, and inoculations on different varieties.—As to citrus canker it appears that organisms can not live long in the soil. No canker was found on the roots of any of the trees that were destroyed. The organism can live on sterilized cotton cloth, potato agar, pine shavings and soil for a long time, but on unsterilized cotton cloth, shavings and soil it lives for a short time only.—In melanose it has been observed that if the spray is not applied in time the disease is not controlled. When Bordeaux oil is used it must be followed with oil emulsion spray to control insects.—Scaly bark can be carried by bud wood. In one grove the disease seemed to have been spread by a budding crew.—As to wither-tip, cultures were made from the diseased specimens, and *Colletotrichum gloeosporioides* was always obtained.—In 1923 cucumbers suffered considerably from a state-wide epidemic of downy mildew.—Tomatoes were severely attacked by nailhead rust (*Macrosporium solani*) in almost all areas of the State. Seed were selected in order to obtain resistant types.—*Corticium Stevensii* on pear trees has proved disastrous but was controlled perfectly by 4-4-50 Bordeaux mixture. Sprays were applied during the spring, beginning with a dormant spray and ending after the new growth had developed.—Fig trees have been defoliated in early spring due to *Physopella fici* Arth. Bordeaux mixture (4-4-50) completely controlled the disease.—Early blight (*Macrosporium solani*) was not general; it caused severe injury to foliage rather late in the season in a few fields. Copper-lime dust did not check the disease which did not occur, however, on vines sprayed with Bordeaux mixture. Some other fungi caused minor injury to the potato. Experimental work was carried out to determine the relative efficiency of 20–80, 25–75 and 30–70 copper-lime

dusts. The vines did not show any difference between the different dusts used.—Blight of citrus seems to occur abundantly on the lighter, drier types of soils, especially where underlain by coquina rock and least abundantly on low hammock. It occurs on practically all kinds of citrus regardless of rootstock. No causal organism has been found. This work is being conducted by A. S. Rhoads.—A large number of other diseases on various crops are mentioned, some being new to Florida. Internal fruit spot on mango, the cause of which is unknown, was found on several varieties. Coconut trees showing bud rot (*Phytophthora faberi*) were burned. Considerable harm was done to young nursery stock by this fungus.—*J. C. Th. Uphof.*

959. Christie, G. I., and H. J. Reed. **Report of the director.** Purdue Univ. [Indiana] Agric. Exp. Sta. Ann. Rept. **36**: 1–79. *Fig. 1–29.* 1923.—Summaries of results in the study of leaf rust of wheat, rye, and corn, corn root and stalk rot, potato leaf roll, and soybean diseases are given. Reports of the Departments of Horticulture and of Soils and Crops are included.—*M. W. Gardner.*

960. Christie, G. I., and H. J. Reed. **Report of the director.** Purdue Univ. [Indiana] Agric. Exp. Sta. Ann. Rept. **37**: 1–64. *Fig. 1–34.* 1924.—Certain of the outstanding results obtained in plant disease investigation are presented. Reports of the Departments of Horticulture and of Soils and Crops are included.—*M. W. Gardner.*

961. Esty, J. R., and A. E. Stevenson. **The examination of spoiled canned foods. 1. Methods and diagnosis.** Jour. Infect. Diseases **36**: 486–500. *Fig. 1–2.* 1925.—Methods of study of canned goods with the object of control of spoilage are discussed under such headings as classification of spoilage from appearance of container, incubation of canned products, methods of sampling, culture of organisms responsible for spoilage, observations for imperfections in can. Principles are presented for diagnosis of the causes of different types of spoilage or possible future spoilage under the conditions of the packs.—*R. L. Starkey.*

962. Fulton, H. R. [Rev. of: Nowell, William. **Diseases of crop plants in the Lesser Antilles.** *383 p.* West Indian Committee: London, 1923 (see Bot. Absts. 13, Entry 5328).] Phytopathology **15**: 433. 1925.

963. Gardner, Max W. **Potato and tomato diseases.** Trans. Indiana Hort. Soc. **1924**: 124–132. 1925.—The situation in Indiana with respect to the following diseases is discussed: Fusarium wilt, early blight, black scurf, mosaic and leaf roll of potato; and Fusarium wilt, Septoria leaf spot, early blight, bacterial spot, mosaic, and leaf mold of tomato. New information is included on the anatomical effects of the streak or winter blight type of tomato mosaic and on fruit invasion and seed transmission in the case of the leaf mold fungus, *Cladosporium fulvum.—Author.*

964. Gassner, Gustav. **Die Verwendung von Quecksilberbeizmitteln in der wiederholten Tauchbeize (Kettenbeize). [The use of mercury preparations (for seed treatment) in relation to reduction of concentration through repeated dipping.]** Zeitschr. Pflanzenkrankh. **35**: 1–15. 1925.—The article reports investigations on reduction of concentration of Germisan, Segetan, and Uspulun solutions through repeated use in seed treatment.—*H. T. Güssow.*

965. Gregory, C. T. **Disease resistant cabbage.** Trans. Indiana Hort. Soc. **1924**: 150–151. 1925.—A popular discussion for Indiana growers.—*M. W. Gardner.*

966. Gregory, C. T. **Disease resistant fruits and vegetables.** Trans. Indiana Hort. Soc. **1924**: 118–121. 1925.—Growers are advised as to the method of developing disease resistant strains of vegetables by the selection of resistant individual plants. Historical information is given concerning the development of certain resistant varieties such as yellows-resistant early cabbage, and a list of vegetable and apple varieties resistant to certain diseases is appended.—*M. W. Gardner.*

967. Hamilton, C. C., and C. M. Smith. **A colorimetric method for showing the distribution and quantity of lead arsenate upon sprayed and dusted surfaces.** Jour. Econ. Entomol. **18**: 502–509. 1925.—The methods for showing the distribution and quantity of lead arsenate, as presented in this paper, were developed to meet the needs of the senior author in a study of spreaders. The usual methods of determining the distribution of lead arsenate were inadequate and a test shorter and easier than the standard Gutzeit method of arsenic determination was needed for showing the quantity of lead arsenate upon sprayed surfaces. Sev-

eral ways for indicating the distribution of lead arsenate were tried, such as photographs, x-ray photographs, microscopical examinations, etc., but none proved satisfactory except the "printing out" chemical method here described. The method for determining the quantity of lead arsenate was developed from the latter. Repeated tests have shown that, with careful manipulations, the methods described are accurate and that the probable error is less than variations due to differences in spraying. The manipulations are easily and rapidly made and do not require much or costly apparatus.—*Authors' abstract.*

968. Höstermann, G. **Eine bedenkliche Art der Verwendung von Schwefel als Pflanzenschützmittel.** [**A doubtful use of sulphur for plant protection.**] Gartenwelt **28**: 283–284. 1924.—The writer warns against the practice of burning sulphur in green houses. Free SO_2 in 1:50,000 of the volume of the air shows characteristic damage on the leaves after a short time, whereas 1:100,000 takes a longer time to show the effects. When the Campell-Patent-Sulphur evaporator and other appliances are used in green houses to combat diseases, care should be taken during the process to exclude oxygen from the air in order to prevent formation of CO_2.—*J. C. Th. Uphof.*

969. Jones, Fred R., and M. B. Linford. **Pea disease survey in Wisconsin.** Wisconsin Agric. Exp. Sta. Res. Bull. 64. *1–30. Fig. 1–8.* 1925.—A report of an intensive field survey, with notes from laboratory studies on the diseases of canning peas in Wisconsin. The survey, which was conducted in coöperation with 30 canning companies, and which covered 688 fields in 37 factory districts, aimed to determine the relative importance of the several diseases of peas and to study their field occurrence with special reference to cropping systems and soil types. Rootrot, caused by *Aphanomyces euteiches* Dreschler, was the most widely distributed and destructive disease encountered. It occurred in 32% of all fields examined and caused losses estimated at 8% of the total yield of the inspected acreage. Root-rot rarely occurred in fields growing the 1st crop of peas; its frequency of occurrence and thoroughness of infestation rose rapidly with increased numbers of crops of peas. All fields growing the 5th crop were more or less infested, over ½ of them being thoroughly infested. Up to the 4th crop the average rate of increase in severity of rootrot infestation was slow; increase after the 4th crop was rapid. In fields where rootrot had formerly caused losses it was found destructive again after an interval of 10 years during which no peas had been grown. Peas were found growing on 27 distinct soil types and 7 groups of incompletely classified soils, on all of which it appears possible for rootrot to develop. It is more severe and more difficult to avoid on clays and clay loams as a group and on poorly drained soils of other classes than on lighter and well drained soils. Soil type appeared to influence disease only through its water relations. Where rotation is relied upon for the control of this disease a period of 4–5 years between crops of peas is recommended for average Wisconsin conditions. Careful annual inspection to detect the first appearance of rootrot with subsequent avoidance of planting peas in fields known to be infested is recommended as the surest means of avoiding losses from rootrot. No commercial variety of canning peas is sufficiently resistant to be safe for planting in fields known to be thoroughly infested. Other diseases discussed briefly are: an undescribed wilt disease; Fusarium stem and rootrot (*Fusarium martii pisi*); seedling and root injury (*Rhizoctonia* and *Pythium* spp.); leaf and podspot (*Ascochyta pisi*); leafblotch (*Septoria pisi*); Septoria leafspot (*Septoria flagellifera*); anthracnose (*Colletotrichum pisi*); downy mildew (*Peronospora viciae*); bacterial blight (*Pseudomonas pisi*); and mosaic.—*Authors.*

970. Jones, L. R. [Rev. of: Whetzel, H. H., L. R. Hesler, C. J. [T.] Gregory, and W. H. Rankin. **Laboratory outlines in plant pathology.** *2nd ed. 231 p.* W. B. Saunders Co.: Philadelphia, 1925 (see Bot. Absts. 14, Entry 6599).] Phytopathology **15**: 432–433. 1925.

971. Meier, Fred C. **Extension work in plant pathology, 1923.** U. S. Dept. Agric. Dept. Circ. 329. *1–20. Fig. 1–9.* 1924.—This is an account of the national program for the control of plant diseases.—*L. R. Hesler.*

972. Mense, Carl, Editor. **Handbuch der Tropenkrankheiten.** [**Handbook of tropical diseases.**] *3rd ed.* **Vol. 1.** *XVIII + 713 p. Pl. 1–12 (5 col.), fig. 1–341;* **Vol. 2.** *XIII + 1019 p. 18 pl. (14 col.), 306 fig.;* **Vol. 3.** *XIV + 592 p. 7 col. pl., 152 fig.* Johann Ambrosius Barth: Leipzig, 1924.—This book, written from the viewpoint of tropical medicine, covers the following main subject matter: Vol. 1. Disease carriers and disease incitants among the

Arthropoda, by Adolf Eysell; and blood technique for tropical diseases, by Victor Schilling.—Vol. 2. Leprosy, by Georg Sticker; Malta fever, by Martin Mayer; Asiatic cholera, by Paul Krause; "Psittakosis," by Filippo Rho; plague, by P. C. Flu; the "tsutsugamushi" disease, by M. Miyajima; sprue, by Hermann Dold; beriberi, by Bernhard Nocht; the tropical skin diseases, by Albert Plehm; the tropical intoxication diseases I, by Filippo Rho; II, by E. S. Faust.—Vol. 3. Malaria and blackwater fever, by H. R. P. Ziemann.—*Frederick V. Rand.*

973. Morgan, A. C., and R. G. Mewborne. **The distribution of an insecticide made visible.** Jour. Econ. Entomol. **18**: 299–301. 1925.—A mixture of phenolphthalein and arsenate of lead was dusted on tobacco. A print of the leaves was taken on filter paper impregnated with an aqueous solution of sodium hydrate. How thoroughly an insecticide is distributed under varying conditions of application has long been a matter of guess work or determinable only by the slow and laborious methods of analysis. The present method offers an easy and immediate determination to the entomologist and layman who may not have available the services of a chemist. The method is applicable to all dusts of whatever character and also to sprays.—*Authors' abstract.*

974. Ramsay, A. A. **Variations in samples of copper carbonate.** Agric. Gaz. New South Wales **36**: 482–483. 1925.—In an analysis of 6 samples, the amount of basic copper varied from 36 to 72%. It is noted that the quality of samples of commercial copper carbonate have improved in recent years.—*L. R. Waldron.*

975. Rosa, J. T. **On the preparation of mercuric chloride solutions.** Proc. Ann. Meeting Potato Assoc. America **11**: 113–115. 1924.—Results of tests are reported on the use of chemically pure sodium and ammonium chloride and common table salt to facilitate the solution of mercuric chloride. The addition of equal amounts of any one of these materials to that of the mercuric chloride in warm water resulted in rapid solution of the mercuric salt. Where 4 times as much of the other salts was added in cold water the time required for the mercuric chloride to go into solution was materially shortened. There are some indications that the solution prepared with sodium chloride compares favorably with that of mercuric chloride alone, while the solution prepared by the addition of the other materials was less toxic.—*Wm. H. Martin.*

976. Sanders, J. G. **Miscible oils and oil emulsions.** Jour. Econ. Entomol. **18**: 287–291. 1925.—Oil sprays in emulsion form are gaining prominence throughout the U. S. A. Attention is called to the indefinite nature of recommendations for the preparation of homemade emulsions. "Red engine oil" as recommended is too indefinite, since hundreds of specifications for these oils are possible, with tremendous variation in viscosity, base, gravity, cold test and color. Pale or yellow oils would serve as readily for emulsions. Although paraffin oil has been specifically recommended, asphalt base oils lend themselves more readily to emulsification. The variability of water content and base of fish oil soaps is discussed, along with the variations in saponification value. Experiences in several states have shown that recommendations for home prepared emulsions should take into consideration the character and type of soaps used as well as the types of water locally available. Until some careful tests are made with oils of varying types and viscosities, no specifications for the oil most desirable for homemade emulsions can be offered.—*Author's abstract.*

977. Steinmann, A. **De ziekten en plagen van Hevea Braziliensis in Nederlandsch-Indië. [Diseases and pests of Hevea Braziliensis in the Dutch East Indies.]** *XIII + 146 + 22 p. 90 pl. + 26 colored pl.* Archipel Drukkerij: Buitenzorg, 1925.

978. Stockhausen. **Trockenbeize. [Dry seed treatment.]** Mitteil. Deutsch. Landw. Ges. **40**: 592–593. 1925.—Description with manufacturer's name and price of these machines in which seed grain may be treated with dry chemicals. "Neusaat" is a large power driven machine while "Primus" and "Ideal" are hand or power driven and of smaller capacity.—*A. J. Pieters.*

979. Stoddard, E. M., D. H. Rose, and N. E. Stevens. **Spraying strawberries for the control of fruit rots.** U. S. Dept. Agric. Dept. Circ. 309. 1–4. 1924.—Spraying strawberries is frequently recommended but there is no region where spraying is generally practised. A few growers in widely separated localities have sprayed for fruit rots and have reported an

apparent reduction in losses. Systematic experiments are briefly reported in the circular. The work was all done in fields near Beebe, Arkansas. The sprays employed were Bordeaux mixture, 4-4-50; copper-lime dust; and sulphur dust (arsenic-free). Results indicate that in the region where the work was carried on, strawberry rots may be reduced by spraying with Bordeaux mixture; in some instances dusting is valuable.—*L. R. Hesler.*

980. Thompson, Noel F. **Chemical eradication of the common barberry.** U. S. Dept. Agric. Dept. Circ. 332. *1–4.* 1924.—The difficulties of eradicating the barberry are presented. Of the many chemicals tested, the use of common salt and kerosene is described.—*L. R. Hesler.*

981. Tisdale, W. B. **Report of the Tobacco Experiment Station.** Florida Agric. Exp. Sta. Ann. Rept. **1924:** 121R–129R. *Fig. 8–14.* 1924.—Black shank (*Phytophthora nicotinae*) developed in many new localities of Gadsden County; many fields were a complete failure. Total loss amounted to about 20% of the crop. The fungus grows on certain media at temperatures ranging from 10 to 20°C., optimum being about 30°. It grows best on neutral or slightly acid media. Infection is rapid on young plants. Only 4 out of 54 selections proved to be somewhat disease resistant.—Strains resistant to root-rot (*Thielavia vasicola* Zopf.) were selected. Two selections of the 2nd generation of Big Cuba showed resistance.—Experiments for the control of wildfire (*Bacterium tabacum*) proved successful. Beds were made on new land, old beds steamed, and seed disinfected. Plants were sprayed with Bordeaux mixture until ready to transplant. There is no evidence that wildfire organisms overwinter in the field in sufficient numbers to produce infection after the plants are transplanted.—Blackfire was prevalent, causing considerable damage in some fields to the sand leaves and first middle leaves. It was more serious on tobacco in the open than under shade and appeared to be more serious on Big Cuba than on Connecticut Round Top.—Scab is a new fungus disease of seedlings. In its early stages it causes irregular, olivaceous blotches on the upper surface of leaves and stems; later the leaves turn yellow. During rainy periods the petioles and stems undergo a soft rot. The isolated fungus had the characteristics of a Cladosporium.—Granville wilt was of minor importance.—Frenching was serious under shade in the case of certain bright and wrapper tobaccos.—Non-parasitic leaf-spots of different types were observed; no organisms could be isolated. Few or none of these spots were to be found on leaves higher up on the stems.—*J. C. Th. Uphof.*

982. Trouvelot, B., et F. Willaume. **Sur un nouveau principe de pulvérisateur utilisant la chaleur comme force dynamique et activante (Brouillards fredes sur humidifiés). [A new type of spraying machine.]** Rev. Path. Vég. et Entomol. Agric. **12:** 44–55. *Fig. 1–3.* 1925.—A jet of spraying mixture injected by the vapor from a boiler is thrown upon plant organs as far as 1.5 meters from the sprayer as a mixture of very small droplets formed of condensed vapor, and of bigger drops from the sprayed mixture, which thoroughly drench the plant organs and parasites.—*J. Dufrenoy.*

983. Walker, J. C. **Cabbage-seed treatment.** U. S. Dept. Agric. Dept. Circ. 311. *1–4. Fig. 1–2.* 1924.—Seed treatment is suggested as being a very essential and low-priced insurance against 2 seed-borne parasites (black-leg [*Phoma oleracea*] and black-rot [*Bacillus campestris*]). The mercuric-chloride method is simpler than the hot-water method, but its limitation is that the black-leg fungus, though greatly reduced, is not entirely killed; black-rot is almost completely controlled. Each method is detailed.—*L. R. Hesler.*

984. Yoder, P. A. **Hot-water treatment of dormant and sprouted seed cane.** U. S. Dept. Agric. Dept. Circ. 337. *1–3.* 1925.

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 6, 122, 138, 141, 326, 351, 420, 625, 671, 679, 792, 961, 989, 1066, 1268)

985. Anonymous. [Rev. of: Martindale, W. Harrison, and W. Wynn Westcott. **The extra pharmacopoeia of Martindale and Westcott.** *18th ed.* Vol. 1. *xxxviii + 1163 p.* H. K. Lewis & Co.: London, 1924.] Nature **115**: 869. 1925.

986. Allinger, Gustav. **Medizinische Garten und Garten bei Krankenhäuser. [Medicinal gardens and gardens near hospitals.]** Gartenwelt **28**: 118–122. *5 fig.* 1924.—A description is given of the development and origin of medicinal gardens and of gardens found around hospitals. The writer starts with the garden of the monastery of St. Gallen, in 838.—*J. C. Th. Uphof.*

987. Bretin, Ph., A. Rochaix, et C. Roux. **Sur l'absence de propriétés microbicide et infertilisante de l'essence de Calycanthus occidentalis. [Absence of germicidal or sterilising properties in the oil of Calycanthus occidentalis.]** Compt. Rend. Soc. Biol. **91**: 1417–1419. 1924.—Calycanthus oil is related to Eucalyptus oil, which has a very slight antiseptic power. Calycanthus oil seemed to possess no antiseptic property whatever when tried with Eberth's Bacillus or with *Staphylococcus aureus.—Oran Raber.*

988. Bridel, M., et C. Charaux. **Le rhamnicoside, glucoside nouveau, generateur du vert de Chine, retire de l'ecorce de tige du Nerprun purgatif. [Rhamnicoside, a new glucoside, produced in green China beans, and stored in the bark of the stem of Rhamnus cathartica.]** Compt. Rend. Acad. Sci. Paris **180**: 1047–1049. 1925.—A further study was made of the chemistry of this new glucoside which is also found in other species of *Rhamnus.—C. H. Farr.*

989. Bridel, M., et C. Charaux. **Le rhamnicoside, glucoside nouveau, générateur du vert de Chine, retiré de l'ecorce de tige du Nerprun purgatif (Rhamnus cathartica L.). [Rhamnicoside, a new glucoside, the mother-substance of Chinese green, obtained from the stem cortex of Rhamnus cathartica.]** Bull. Soc. Chim. Biol. **7**: 811–821. 1925.—By extraction of the sun-dried bark in a Soxhlet with 95% alcohol, an unstable glucoside which the authors name rhamnicoside is obtained. Its properties are described. In cold water it breaks up, yielding water-soluble glucosidal substances containing primeverose and oxymethyl-anthraquinone groups and a water soluble crystalline glucoside, thamnicoside. After hydrolysis of the water soluble glucosides by an enzyme prepared from the seed of *Rhamnus utilis* and extraction of the hydrolysate with ether, emodin crystallized out from the ether. Rhamnicoside is the substance from which the coloring matter known as "Lokao" or "vert de Chine" is derived. The preparation from the glucoside and from its sodium salt, of a pigment having tinctorial properties identical with those of the vert de Chine of the markets is described. The properties and elementary formula of the glucoside are stated. On hydrolysis it yields glucose and xylose, and an insoluble body which is named rhamnicogenol. Glucose and xylose are probably combined as primeverose in the molecule, so that the glucoside belongs to the primeverose-containing group. (See preceding abstract.)—*Joseph S. Caldwell.*

990. Chen, M. C. **[Indigo analysis.]** (In Chinese.) Jour. Ministry Agric. and Commerce Republic of China **11**[3]: 2. 1924.—The author made a tentative analytical study of 55 samples of indigo secured from as many localities noted for indigo production. In the analysis, determination was made of the percentage of water, ash, and pure indigo in the samples.—*C. Y. Chiao.*

991. Delauney, P. **Sur les glucosides de plusieurs espèces d'Orchidées indigènes. [Glucosides of several species of indigenous orchids.]** Compt. Rend. Acad. Sci. Paris **180**: 224–225. 1925.—Loroglossoside is found in 4 additional species of orchids, namely, *Goodyera repens, Limodorum abortivum, Spiranthes autumnalis,* and *Orchis ustulata.—C. H. Farr.*

992. Dupont, Georges. **Les resines de Coniferes. [The resins of the conifers.]** Bull. Soc. Chim. Biol. **7**: 893–910. 1925.—A lecture summarizing our present knowlege of the com-

position and relationships of the constituents of these resins, with a statement of the researches in progress in this field under the author's direction at Bordeaux.—*Joseph S. Caldwell.*

993. England, J. W., et al. **The first century of the Philadelphia College of Pharmacy, 1821–1921.** *728 p. 272 illus.* The Philadelphia College of Pharmacy and Science: Philadelphia, Pennsylvania, 1922.—This volume contains a very comprehensive history of the Philadelphia College of Pharmacy, its progress and development from its founding in 1821 to the completion of its centennial celebration in 1921. Bibliographical lists of graduates of that institution as well as of the Department of Pharmacy and Chemistry of the Medico-Chirurgical College which was merged with it in 1916, are included.—*H. W. Youngken.*

994. Goodson, John Augustus, and Thomas Anderson Henry. **Echitamine.** Jour. Chem. Soc. [London] **127**: 1640–1648. 1925.—The alkaloid, echitamine, was prepared from the bark of *Alstonia congensis* Engler, and a study of its chemical properties was made.—*F. E. Denny.*

995. Goosens, V. **Contribution à l'étude de la flore économique du Congo-Belge. Notes au sujet de l'Allanblackia floribunda Oliv. (n. v. Bondjo) et de l'Ongokea klaineana Pierre (n. v. Boleko).** [The economic flora of the Belgian Congo. Notes on Allanblackia floribunda and Ongokea klaineana.] Bull. Agric. Congo-Belge **12**: 442–443. 1921.—The author describes a primitive method whereby he obtained an extraction of oil from the fruit of *Allanblackia floribunda* and *Ongokea klaineana*. From the seed of *Allanblackia* he obtained 10.25% of oil, from *Ongokea* he obtained 17.9% of oil from the fresh kernel.—*P. van Oye* (*translated*).

996. Goris, A., et M. Mevis. **Sur la présence de deux alcaloides dans l'Acontinum Anthora L.** [The presence of two alkaloids in Aconitum Anthora.] Compt. Rend. Acad. Sci. Paris **180**: 968–969. 1925.—The alkaloid soluble in ether is called anthorine, and the one which is insoluble in this solvent is called pseudo- anthorine.—*C. H. Farr.*

997. Grinţescu, Gh. P. **Botanică Farmaceutică.** [Pharmaceutical botany.] *750 p. 53 pl.* Tipografiile Române-unite: Bucureşti, 1924.—This is the 1st complete pharmaceutical botany in the Rumanian language. The author's classification of plants is old and unusual. A new plant is described and figured: *Centaurea Angelescuii* Grinţ, a non-medicinal variety of *Centaurea stricta* W. & K.—*Al. Borza.*

998. Gunn, J. W. C. **Slangkop poisoning.** Jour. Dept. Agric. Union South Africa **9**: 141–143. 1924.—The name "slangkop" is applied to different plants in various parts of South Africa, though they are all members of the family Liliaceæ and all have the same action. The poisonous action of these plants is similar to that produced by the "digitalis" group. The properties of slangkop, antidotes, etc., are given.—*L. I. Goldblatt.*

999. Hérissey, H., et J. Cheymol. **Extraction et proprietés de la géine, glucoside générateur d'eugénol, contenu dans le Geum urbanum L.** [The extraction and properties of geine, the glucoside producing eugenol, contained in Geum urbanum.] Compt. Rend. Acad. Sci. Paris **180**: 384–386. 1925.—The chemical constitution of this compound is still undetermined.—*C. H. Farr.*

1000. Herissey, H., et J. Cheymol. **Extraction et proprietés de la géine-glucoside générateur d'eugenol, contenu dans le Geum urbanum L.** [Extraction and properties of geine, the glucoside-forming eugenol present in Geum urbanum.] Bull. Soc. Chim. Biol. **7**: 499–507. 1925.—The extraction, purification and properties of the glucoside are described in detail. On hydrolysis with acid it yields one molecule each of arabinose, dextrose, and eugenol. On treatment with an enzyme extract made from the fresh plant, it is split into eugenol and disaccharide which is probably vicianose, as it can be further split into dextrose and arabinose.—*Joseph S. Caldwell.*

1001. Metcalf, Maynard M. **Amanita muscaria in Maine.** Science **61**: 567. 1925.—The red squirrels often eat *Amanita muscaria.*—*C. J. Lyon.*

1002. Pater, Bela. **Experienţe de culturi cu plante medicinale. Culturversuche mit Medizinalpflanzen.** [Experiments on the culture of medicinal plants. Culture investigations with medicinal plants.] Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **4**: 98–100. 1924 [1925].—The cultivation of *Malva glabra* Desr. in northern Rumania has proved successful. Its parasite, *Puccinia Malvacearum*, does not produce much damage there. *Arachis hypogaea*

is also grown successfully in investigation plots at Cluj. In warmer districts of Rumania this plant can still play an important part.—*Al. Borza.*

1003. Pater, Bela. **Lucrări din laboratorul Staţiunei de plante medicinale din Cluj. Arbeiten aus dem Laboratorium der Arzneipflanzenversuchsstation in Cluj. [Researches from the laboratory of medicinal plant investigations in Cluj.]** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj 3: 103–111. 1923.—The author has found that by careful analysis the rhizomes and root of *Veratrum* yield a greater alkaloidal content which he states to average 1.67% in the rhizome and 1.86% in the root. *Adonis vernalis* still yields a brown or almost black, dried but still serviceable drug. *Herba Adonis vernalis*, in the dried form loses up to ⅓ of its glucosidal content. Culture investigations and chemical analysis of *Nepeta Cataria* showed that the raw material for a native perfume can be produced. The results of oil distillations carried out on *Hyssopus officinalis*, *Salvia Sclarea* and *Thymus vulgaris* are reported. However, they did not give completely satisfactory results as foreshadowing their usefulness for perfume. Culture investigations with *Ruta graveolens* showed that this medicinal plant is well adapted to growth in dry localities.—*Al. Borza.*

1004. Pettinari, Vittorio. **L'action toxique de l'Amanita phalloides Fr. [Toxic action of Amanita phalloides.]** Compt. Rend. Acad. Sci. Paris 180: 163–165. 1925.—Tests were made with invertebrates and cold-blooded vertebrates, using an extract prepared as of an edible fungus.—*C. H. Farr.*

1005. Pettinari, Vittorio. **L'action toxique de l'Amanita phalloides Fr. [The toxic action of Amanita phalloides Fr.]** Compt. Rend. Acad. Sci. Paris 180: 320–321. 1925.—This is a continuation of experiments previously reported in this same volume (see preceding Entry), but applied to warm-blooded animals. Eight species of animals were used. The mimimum toxic and the minimum lethal dosage are determined. Application was made by hypodermic or intra-muscular injection.—*C. H. Farr.*

1006. Viotti, Carin. **Action de l'ergotamine sur le coeur du Mammifère isolé et en état de survie. [Action of ergotamin on the isolated, living mammalian heart.]** Compt. Rend. Soc. Biol. 91: 1101–1104. 1924.—Ergotamin has a constrictive action on the rabbit heart before atropinisation and after a dilating action, but on the guinea-pig heart the only action seen is a dilating one.—*Oran Raber.*

1007. Wang, C. T. **[Report on the study of the indigo industry in China.]** (In Chinese.) Jour. Ministry Agric. and Commerce Republic of China 11^3: 1–10. 1924.—*Indigofera tinctoria*, *Strobilanthus flaccifolius*, *Polygonum tinctoira*, and *Isatis tinctoria* are the principal plants from which indigo is made. *Polygonum tinctoria* has received detailed discussion in the report. Methods of manufacturing indigo, both old and modern, are presented in detail.—*C. Y. Chiao.*

1008. Youngken, H. W. **Pharmaceutical botany.** *4th ed., revised and enlarged. XIX + 538 p. 263 illus.* P. Blakiston's Son & Co.: Philadelphia, 1923.—In this revision, the author has added 53 new pages of subject matter and 25 illustrations. Chapter I has been augmented by the inclusion of a list of standard micro-chemical reagents used in food and drug work, together with formulae for their preparation. Chapter 7, on "Plant organs and organisms," has been lengthened by 23 pages through an amplification of the subject matter of roots, rhizomes, leaves, seed and seedlings. Chapter 9, on "Ecology," has been lengthened by 20 pages on carnivorous plants. A number of new original drawings and photographs and more plant physiology are additional outstanding features.—*Author's summary.*

PHYSIOLOGY

B. M. Duggar, *Editor*

W. J. Robbins, *Assistant Editor*

(See also in this issue Entries 45, 94, 98, 106, 107, 112, 179, 194, 197, 263, 267, 277, 289, 292, 296, 307, 321, 342, 361, 369, 376, 377, 428, 439, 441, 452, 495, 617, 625, 634, 648, 696, 722, 724, 747, 795, 810, 856, 867, 883, 885, 891, 906, 909, 948, 961)

GENERAL

1009. Bancroft, Wilder D. **The development of colloid chemistry.** Jour. Franklin Inst. 199: 727–760. 1925.—This is an historical and popularized statement of the objective, methods, and accomplishments of colloid chemistry, including a consideration of Loeb's work upon *Fundulus* and of Osterhout's upon sea weeds.—*Ernest S. Reynolds.*

1010. Lillie, Ralph S. [Rev. of: Bayliss, William M. **Interfacial forces and phenomena in physiology.** *196 p.* Methuen & Co.: London & New York, 1923.] Science 62: 84–85. 1925.

PROTOPLASM, MOTILITY

1011. Heilbrunn, L. V. **The colloid chemistry of protoplasm. III. The viscosity of protoplasm at various temperatures.** Amer. Jour. Physiol. 68: 645–648. 1924.—*Cumingia* eggs were centrifuged at a rate giving a force 311 times gravity at temperatures varying from about zero to 32°C. The time necessary to produce zoning, due to the movement of protoplasmic granules was the criterion of viscosity. At about 15°C. the high point in the curve of viscosity occurs, except at temperatures about 2° and 30°C. where very sharp increases in viscosity take place. Viscosity is progressively less as the temperature is either increased or decreased from 15°C. Apparent freezing of tropical plants at temperatures somewhat above 0°C. may be associated with the phenomenon of coagulative changes indicated by this investigation.—*Ernest S. Reynolds.*

1012. Heilbrunn, L. V. **The colloid chemistry of protoplasm. IV. The heat coagulation of protoplasm.** Amer. Jour. Physiol. 69: 190–199. 1924.—The appearance of zonation in sea-urchin and *Cumingia* eggs after centrifuging was the criterion used to determine the coagulation of protoaplsm with changes of temperature. Death by heat is preceded by coagulative changes at temperatures too low to indicate protein coagulation. This leads to the belief, supported by experimental evidence, that fatty materials are first affected by heat. Thus the coagulation of protoplasm, at least at low temperatures, is due to these effects on fats, which accounts also for the reversible character of protoplasmic coagulation, such as acceleration and retardation of protoplasmic streaming under changes of temperature, as contrasted with the irreversible coagulation of pure proteins.—*Ernest S. Reynolds.*

PERMEABILITY, PHYSICO-CHEMICAL RELATIONS

1013. Andre, G., et E. Demoussy. **Sur l'absorption selective du potassium par les plantes.** [**The selective absorption of potassium by plants.**] Compt. Rend. Acad. Sci. Paris 180: 1052–1054. 1925.—Data are given on the amount of potassium and of sodium and the potassium-sodium ratio for the exterior, middle, and interior zones of beets on July 31, and on August 31. It is concluded that the greater selective absorption of potassium is due to its higher rate of mobility.—*C. H. Farr.*

1014. [Blagoveshchenskii, A.V.] Благовещенский, А. В. **Исследования над осмотическим давлением у горных растений.** [**The osmotic pressure of mountain plants.**] Журнал Русского Ботанического Общества. [Jour. Russian Bot. Soc.] 7: 125–135. 1922.—The author has investigated the osmotic pressure in the mountain plants of Turkestan. Mesophytes as well as xerophytes, collected in different altitudes and in different conditions of habitat, were subjected to investigation. The results obtained are as follows: (1) Mesophytes from a moist river bank (altitude 930 m.) showed an osmotic pressure of 7.15–21.5 atmospheres (atm.); (2) xerophytes of the valley (alt. 960 m.), 14.3–71.6 atm.; (3)

xerophytes of the slope of a gully (alt. 1800 m.), 21.5–72 atm.; (4) mesophytes of the zone of alpine meadows (alt. 2500 m.), 3.6–21.5 atm. The author comes to the conclusion that the osmotic pressure is a stable character of the given plant, fluctuating within narrow limits and depending on environmental conditions. He holds that every vegetative association is characterised by a specific average osmotic pressure. The fact that the plant is confined to a given habitat is accounted for by the direct influence of natural selection.—*Dorochenko.*

1015. Coward, Hubert Frank, Leo Spencer, and Frederick Charles Wood. **Some observations on sorption by cotton.** Jour. Textile Inst. **14**: T529–T533. *Fig. 1–2.* 1923.—The authors' experiments on behavior of bleached cotton in aqueous solutions show that from the simpler crystalloidal solutions cotton absorbs at ordinary temperatures about 50 cc. per 100 gm. of cotton. The solution is taken up as a whole except for a small preferential absorption which in some cases is probably an adsorption. In addition to the preferential absorption of NaOH the authors have observed the same phenomenon in dilute cuprammonium hydroxide solutions. They suggest that possibly a somewhat considerable preferential absorption may prove to be a necessary antecedent to both the swelling and the solution of cotton, and that there seems to be every reason for ascribing to chemical reaction every case of marked preferential absorption by cotton.—*Frederick V. Rand.*

1016. Demoussy, E. **Sur les déséquilibres de concentration amenés par la diffussion.** [**Lack of equilibrium maintained during diffusion.**] Compt. Rend. Acad. Sci. Paris **180**: 1359–1361. 1925.—No satisfactory explanation has yet been given of the persistence of a higher concentration of a given salt in the root than in the soil solution, and of the absorption of a given salt from a solution which contains less than does the root. J. Loeb suggested the possibility of a loose combination with the living protoplasm, and recently Lapicque has invoked protoplasmic movements. A physical experiment is performed in which the concentration of HCl is maintained higher on one side of a membrane than on the other by the introduction of calcium acetate. It is held that some such phenomenon may occur in plants, but the experiments are regarded as too special to afford complete explanation.—*C. H. Farr.*

1017. MacDougal, D. T., and B. L. Clarke. **The hydrophilic effect of ions on agar and protoplasmic components.** Science **62**: 136–137. 1925.—The differential action of univalent and divalent ions of the Hofmeister series is generally found to hold with relatively concentrated solutions. This action is also found to hold for extremely low concentrations if precautions be taken to account for such factors as losses by solution and the exact composition of the colloidal system under investigation.—*C. J. Lyon.*

1018. MacDougall, F. H., and R. G. Green. **Theory of electrical conductance of inhomogeneous systems with applications to suspensions of blood cells.** Jour. Infect. Diseases **36**: 330–339. 1925.—A rigorous development is given for the following equation giving the resistance of spherical conductors suspended in a conducting medium: $R = M \cdot \frac{1 + a\left(\frac{S - M}{2S + M}\right)}{1 - 2a\left(\frac{S - M}{2S + M}\right)}$. Here M = resistance of suspending medium, a = volume occupied by conductors, S = resistance of cells, R = resistance of suspension. Methods for checking the accuracy of this equation and other equations are described. This equation is found to hold for very concentrated suspensions while other equations tested do not hold under these conditions. The specific resistance of normal human red blood cells is found to be about 2,000 ohms.—*Authors' abstract.*

1019. Marshall, M. S. **Surface tension of culture mediums.** Jour. Infect. Diseases **35**: 526–536. *Fig. 1–2.* 1924.—The surface tension of media was depressed by additions of peptone, beef extract, infusion broth, ascitic fluid, or castor oil soap. Nine standard media showed surface tensions between 44 and 54 dynes per cm. There was no change in surface tension during growth of various colon-typhoid organisms in plain or dextrose infusion broth. In media of different surface tensions, organisms had different rates of growth and of gas metabolism.—*R. L. Starkey.*

1020. Rawitscher. [Rev. of: Pfeffer, W. **Osmotische Untersuchungen. Studien zur Zellmechanik. Zweite unveränderte Auflage. [Osmotic investigations. Studies in cell mechanics.]** *2nd Ed. viii + 236 p.* 1921.] Zeitschr. Bot. **14**: 78. 1922.

1021. Ruhland. [Rev. of: Crozier, W. J. **Intracellular acidity in Valonia.** Jour. of Gen. Phys. **1**: 581–583. 1919.] Zeitschr. Bot. **14**: 84–85. 1922.

1022. Ruhland. [Rev. of: Osterhout, W. J. V. **A comparative study of permeability in plants.** Jour. Gen. Phys. **1**: 299–344. 1919.] Zeitschr. Bot. **14**: 84. 1922.

1023. Ruhland. [Rev. of: Osterhout, W. J. V. **A comparison of permeability in plant and animal cells.** Jour. Gen. Phys. **1**: 409–413. 1919.] Zeitschr. Bot. **14**: 83–84. 1922.

1024. Ruhland. [Rev. of: Osterhout, W. J. V. **Antagonism between alcaloids and salts in relation to permeability.** Jour. Gen. Phys. **1**: 515–519. 1919.] Zeitschr. Bot. **14**: 82. 1922.

1025. Ruhland. [Rev. of: Osterhout, W. J. V. **Decrease of permeability and antagonistic effects caused by bile salts.** Jour. Gen. Phys. **1**: 405–408. 1919.] Zeitschr. Bot. **14**: 82. 1922.

1026. [Sabinin, D. A.] Сабинин, Д. А. **О способе определения вели чины движущей силы плача растений.** [**The method of determining the strength of the moving power of bleeding in plants.**] Извест. Биологич. Научно-Исслед. Института при Пермском Университета. (Bull. Inst. Biol. Sci. Invest. Univ. Perm) **2**[5]: 195–206. 1923.—The author considers the active force in the bleeding of plants to be osmotic pressure and gives a method of determining the amount of this pressure. It is equal to the osmotic pressure of a solution which, when the root-system is placed in the latter, would counterbalance the pressure of exudation, that is, stop it. The concentration of such a solution is found in an indirect way. Considering the comparatively low pressures we have to deal with, the author thinks it possible to admit that the rapidity of filtration is proportionate to the pressure. In this case $B = k_1X$; $A = k_2(X-P)$; $B:A = k_1X:k_2(X-P)$. A = rapidity of bleeding in solution; B = the same in water; X = pressure of exudation; P = osmotic pressure of the solution; k_1 and k_2 = coefficients of the proportion. This formula may be used on the condition of impermeability of the plasma membrane to external solutions. In order to satisfy this condition the author recommends to leave the root-system for a short time (1–2 minutes) in the solution and to work with concentrations not over N/0.1. From his experiments on the short duration of the influence of weak solutions on the rapidity of bleeding, when the root-system is again transferred from the solution into water, the author thinks it admissible to consider as equal the coefficients of the ratio of the rapidity of filtration in both instances, when the root system is in water and when it is in the solution. In this case our formula reads $X = \frac{B-P}{B-A}$. The value of P is calculated according to the concentration of the solution and the values of A and B are found experimentally. In order to determine them the author describes the exact methods of determining the rapidity of the bleeding.—In conclusion, the author gives a table which shows the applicability of this method; different solutions and different concentrations of them produce the same strength of exudation pressure.—*Dorochenko.*

1027. Smith, Homer W. **The action of acids on cell division with reference to permeability to anions.** Amer. Jour. Physiol. 72: 347–371. 1925.—Cell division of fertilized eggs of the sand dollar, *Echinarachnius parma*, was used as the criterion of penetration of acids and anions into the eggs. The author's summary and conclusions are as follows: "The quantitative relations involved in the action of carbonic, acetic and propionic acid on the process of cell division indicate that the egg cell is freely permeable to both the acid molecules and the anions of these acids. These relations also show that the egg cell possesses a capacity to resist the action of these acids which manifests itself in an apparent retention of a constant quantity of anion in excess of that present in the external fluid. By taking into consideration this departure from otherwise simple equilibrium conditions, it is shown that complete repression of cell division occurs at a constant intracellular hydrogen-ion concentration in solutions containing various concentrations of these acids, and in various mixtures of two of them. In sea water solutions containing, singly, HCl, lactic acid, the dihydrogen phosphate ion (H_2PO_4-) or the monohydrogen tartrate ion ($HC_4H_4O_6-$), cell division is repressed only when the hydrogen-ion concentration of the solution exceeds a limiting value (pH 5.0 to 4.6) compatible with cell division. In view of the fact that in the presence of carbonic acid cell division is repressed at an intracellular hydrogen-ion concentration differing not very greatly from pH

6.5, it must be concluded that the egg cell is not freely permeable to lactic acid, H_2PO_4-, $HC_4H_4O_6-$ or the hydrogen ion.—The failure of sodium lactate, disodium phosphate and disodium tartrate to modify the precise, quantitative action of carbonic or acetic acid on cell division shows that the egg cell is not freely permeable to the lactate ion, the phosphate ion ($PO_4=$) or the tartrate ion ($C_4H_4O_6=$).—In view of the above facts, the assumption is considered untenable that the demonstrated cell-fluid equilibria with respect to the carbonate, acetate and propionate anions is established under any conditions by the actual migration of these anions from fluid to cell; for such an assumption makes necessary a supporting hypothesis of specific permeability on the part of the cell to different anions in order to explain the failure of the other anions examined to migrate under similar conditions. This assumption appears to be irrational and lacking a necessary foundation in chemical theory or experience.—It is inferred that an equilibrium concentration of anion is established in the cell subsequent to, and in consequence of the entrance into the cell of the respective acid molecule, by some mechanism which operates on other components of the cell-fluid system.—The molecules of benzoic and salicylic acids possess "toxic" properties which are apparently not due to their character as acids. In solutions containing these substances, cell division is repressed at constant concentrations of the acid molecule."—*Ernest S. Reynolds.*

WATER RELATIONS

1028. [Aleksandrov, V. G.] Александров, В. Г. **О завядании листьев травянистых растений. [The wilting of the leaves of herbaceous plants.]** Труды сельско-хоз. опытн. учрежд. Дона и Северного Кавказа. [Trans. Agric. Exp. Inst. of the Don and the Northern Caucasus] **1924**: 1–10. 1924.—The author ascertained the loss of water in the upper and in the lower leaves of the same plant. The experiments were carried out with abscised leaves and consisted in weighing these leaves during several consecutive days. *Helianthus annuus* (a mesophyte), *Amaranthus retroflexus* (a xerophyte), and *Atriplex hortense* (a succulent) were employed. The experiments have shown that in summer, with an indoor temperature, the upper leaves use their water store more economically than the lower ones. The process of losing water is slowest in succulents and most rapid in mesophytes.—*Dorochenko.*

1029. [Aleksandrov, V. G.] Александров, В. Г. **Об одной из вероятных причин высокой продуктивности транспирации у некоторых травянистых растений. [One of the probable reasons of high transpiration in some herbaceous plants.]** Научно-агрономический Журнал [Sci. Agron. Jour.] 1^{11}: 663–671. *Fig. 1–13.* 1924.—The work was carried out in the Tiflis Botanical Garden. The author attempts to find a connection between the structure of the leaf and the rate of transpiration of the plant. By cutting cross sections of leaves distinguished by different rates of transpiration, the author establishes the fact that in species characterised by higher rates of transpiration, the minute nerves of the leaf are surrounded by a special parenchymatous tissue containing chloroplasts. The author holds that this tissue conducts away the assimilants and thus promotes the rapidity of assimilation in the leaf, which leads to a higher rate of transpiration.—*Dorochenko.*

1030. [Frei, L.] Фрей, Л. **Влияние влажности почвы на транспирационную способность растений. [Influence of soil moisture on the transpiration capacity of plants.]** Труды Петрогр. О-ва Естествоиспыт. [Bull. Soc. Naturalists Leningrad] 53^3: 179–210. 1924.—The purpose of the work, carried out in the Tiflis Botanical Garden, was to ascertain whether the cultivation of plants under conditions of insufficient soil moisture produces changes in the transpiration capacity of the plant. This capacity is determined by the amount of water lost by the leaf per surface unit during a unit of time and under definite external conditions. The plants were grown in pots protected by metallic covers against loss of water from the soil and under the 2 conditions of moisture, (1) optimal moisture, 60–70% of the total moisture capacity, and (2) minimal moisture, 35–40%. There were subjected to this investigation the thorn-apple, sunflower, maize, beans, *Mirabilis jalapa* L., *Zygophyllum Tabago* L., and *Atriplex hortensis*. The plants cultivated under conditions of minimal soil moisture were distinguished by considerably smaller size. They accumulated less dry matter and developed a smaller leaf surface than plants cultivated under conditions of optimal moisture. With respect to the thickness of the leaf and the number of stomata per surface

unit, the data obtained in different years were incompatible; thus, in the 1st year (1916) the author recorded a large number of stomata per surface unit in dry-soil plants, while in the 2nd year (1917) the plants cultivated in dry soil differed but little from the control plants. Physiologically, the investigated plants were widely different. The intensity of transpiration in moist-soil plants was always greater than in dry-soil plants. As experiments have shown, an increase of soil moisture up to optimal conditions leads, in dry-soil plants, to an increase in the intensity of transpiration until it equals the intensity of transpiration of plants of optimal moisture, while plants of optimal moisture, when subjected to a decrease of soil moisture down to the minimum, show considerably lower intensity of transpiration than dry-soil plants. Exceptions to the general rule are the xerophytic plants *Zygophyllum Tabago* and *Atriplex hortense*.—*Dorochenko.*

1031. [Maksimov, N. A., and T. A. Krasnosel'skaĭa-Maksimova.] Максимов, Н. А., и Т. А. Красносельская-Максимова. **Исследования над завяданием растений в связи с их засухоустойчивостью.** [The wilting of plants in connection with their drought resistance.] Труды Петр. Общ. Естеств. [Bull. Soc. Naturalists Leningrad.] 53[3]: *81–104.* 1924.—Water deficit in the tissues of plants, on sunny days during the daytime, is observed not only in droughty and arid regions but, according to the authors' observations, is widely spread even among the plants of the moist climate of Leningrad. Plants of a xerophytic type show during day-time, as well as in wilting, a much greater water deficit than plants of a mesophytic type. In the leaves of mesophytes of shady habitats, a perceptible loss of turgidity takes place with so insignificant a loss of water that it can hardly be established by analysis, while xerophytic forms may lose half the water content of their leaves without being much injured.—The leaves of marsh plants are, according to the authors' observations, quite incapable of permanent wilting; with an inconsiderable loss of their water content, they begin to fade and die off without perceptible signs of a loss of turgidity.—The authors consider the wilting of plants to be the most important means of preserving their water supply during times of drought, and think that the faculty of enduring permanent wilting, with a minimal harm to the plant, is an essential feature of the xerophytic organization.—*Dorochenko.*

1032. [Mina, I. D., and A. P. Butovskii.] Мина, И. Д., и А. П. Бутовский. **Водный баланс в листьях некоторых с.-х. растений.** [Diminution of water in the leaves of some cultivated plants.] Бюллетень Сортоводно-Семенного, Управления Сахаротреста. [Bull. Variety and Seed Selection Div. Sugar Trust.] 6: 7–19. 1923.—The conclusions of the author are concerned with the hourly or more particularly daily diminution of the water in the leaves of a few cultivated plants. For this investigation there were used 4 lines of Beloturka wheat, with cells of different sizes; oats, buckwheat; and other plants to a small extent.—The observations show the error of the statement that water loss follows approximately the same course in all plants. Plants actually exhibit significant differences. It is notable to find that certain plants, especially some least resistant to aridity, show an increased percentage of water in the leaves on warm days.—*Dorochenko (translated).*

1033. Walter, Heinrich. **Der Wasserhaushalt der Pflanze in quantitativer Betrachtung.** [The role of water in the plant from the quantitative standpoint.] Naturwiss. u. Landw. Abhandl. u. Vorträge 6. *1–97. Fig. 1–22.* Datterer & Cie.: Freising-München, 1925.—This is a series of lectures on the role of water in the plant and the various processes involved. Osmosis, absorption, swelling, water-content, soil water, obtaining water from the soil, transpiration, water balance, and the role of water in the plant are discussed with special attention to the latest quantitative data available. The lectures on the various phases give in concise form what the author believes is the correct interpretation of the process and with it quantitative data obtained from various authors and a statement of the physical laws governing the process. With each discussion is a bibliography of papers dealing specifically with the phase of the subject under discussion. This is not a complete treatise but serves to supplement the books on physiology now available.—*A. F. Camp.*

1034. [Zalenskii, V. R.] Заленский, В. Р. **О величине транспирации верхних и нижних листьев.** [The intensity of transpiration in the upper and in the lower leaves.] Известия Сарат. Сельск.-Хоз Института. [Bull. Agric. Inst. Saratov] 1[1]: 13–17. 1923.—The author has investigated the intensity of transpiration in leaves taken from different

levels of the plant. The experiments, conducted with a whole series of plants, have clearly shown that the intensity of transpiration per surface unit increases as we pass from the lower to the upper leaves notwithstanding the more xeromorphous structure of the upper leaves.—*Dorochenko.*

1035. [Zhemchuzhnikov, E. A.] Жемчужников, Е. А. **К вопросу об устьичном регулировании испарения у растений.** [**Transpiration by the stomata.**] Труды Сельско.-хоз. Опытн. Учрежд. Дона и Северного Кавказа. [Trans. Agric. Exp. Inst. Don and Northern Caucasus] 1924: 1–34. (Bull. 164.) 1924.—The plants were grown in pots and the latter were provided with metallic covers in order to prevent loss of water by the soil surface. Sunflower, maize, *Ricinus communis*, and Sorghum were investigated. The author comes to the following conclusions: Under conditions of sufficient soil moisture, the process of transpiration reaches its maximum in the 1st hours after noon while with insufficient moisture the maximum is attained in the afternoon hours. On the whole, the curve of transpiration corresponds to the progress of the width of the stomata, both with sufficient and with insufficient water content of the soil; however, the changes in the width of the stomata always precede somewhat the changes in the curve of transpiration. The author states that in regard to the curve of the width of the stomata, a more rapid progress of the widening of the stomata in the first half of the day is observed, the maximum is sooner attained, and falling of the curve sets in sooner than is the case in the curve of transpiration. On the basis of these observations the author comes to the conclusion that the stomata most probably regulate the transpiration of the plants.—*Dorochenko.*

MINERAL NUTRIENTS, SALT RELATIONS

1036. Andre, G., et E. Demoussy. **L'absorption sélective du potassium par les plantes.** [**The selective absorption of potassium by plants.**] Bull. Soc. Chim. Biol. 7: 806–810. 1925.—Potassium is found in plant ash in much larger quantities than sodium in spite of the vastly larger amounts of sodium in the soil. The authors divided forage beets into 2 zones from cortex to center and made separate analyses of the ash of each region. On July 31 the ratio of K to Na was lowest in the exterior zone, intermediate in the medium and highest in the interior zone; on October 31 these differences had disappeared and the ratio was constant throughout. This equalization of amount of Na throughout is regarded as a diffusion effect.—*Joseph S. Caldwell.*

1037. Lagatu, H., et L. Maume. **Relation linéaire entre les quantités successives d'acide phosphorique et d'azote contenues dans la feuille de la vigne bien alimentée.** [**The linear relation between the successive quantities of phosphoric acid and of nitrogen contained in the leaves of well nourished grapevines.**] Compt. Rend. Acad. Sci. Paris 180: 1179–1181. *1 fig.* 1925.—The conclusion regarding phosphorus and nitrogen is analogous to that already published for Ca, Mg, and K. It is concluded that there is a very definite balance between the nutrient elements in the leaf in a well-nourished, producing plant, and that in defective nutrition of an unproductive plant there is an insufficiency or excess of one of the elements in proportion to the others.—*C. H. Farr.*

1038. Latshaw, W. L. **Report on sulfur and phosphorus in the seed of plants.** Jour. Assoc. Official Agric. Chem. 8: 469–470. 1925.—The magnesium nitrate method is recommended for the determination of S and P in plants and plant parts.—*F. M. Schertz.*

1039. Lemmermann, O., and H. Wiessmann. **Versuche mit "Asahi-Promoloid."** [**Experiments with "Asahi-Promoloid."**] Zeitschr. Pflanzenernahr. u. Düngung 4: 345–347. 1925.—"Asahi Promoloid" is a colloidal magnesium silicate which in Japan is said to promote the growth of plants even when added in small amounts and is supposed to act more as a catalyzer than as a fertilizer. The authors ascribe the action of "Asahi Promoloid" to the silicic acid which, as the experiments cited show, was found to promote the growth of plants even more than a sample of the "Asahi-Promoloid."—*F. M. Schertz.*

1040. Lesage, Pierre. **Sur l'emploi de pots perforés, en terre cuite, dans les cultures en solutions.** [**The use of perforated pots of unglazed clay in water cultures.**] Bull. Soc. Sci. et Med. Ouest 1923²: (1–5). 1923.—The author suggests the use of perforated covers of unglazed clay for the solution containers in water cultures. The perforations serve to hold the

plants in place. These covers when paraffined allowed a minimum of evaporation from the container and had no bad effect on the plants being cultured.—*A. F Camp.*

1041. Lomanitz, S. **The influence of sodium chloride upon alfalfa grown in solution cultures.** Soil Sci. **18**: 353–368. *Pl. 1, fig. 1.* 1924.—Alfalfa was grown 77 days in nutrient solutions containing varying amounts of NaCl (0.0–0.6 atmosphere osmotic pressure), using Shive's solution R_5C_2 as a check. Five out of 6 cultures containing NaCl produced a higher yeild than the check, the greatest relative increase in yield being in that of the tops. The curves for water absorption paralleled more or less closely those for yields of tops and of whole plants. Data are given regarding water requirements and absorption of N and Cl.—*W. E. Maneval.*

1042. McHargue, J. S. **The significance of the occurrence of copper, manganese and zinc in forage crops and foods.** Jour. Amer. Soc. Agron. **17**: 368–372. 1925.—Fertile soils contain small amounts of Cu, Mn, and Zn. Plants absorb small amounts of these elements which are stored in the leaves, pericarps, and embryos of the seed. When corn, wheat, and rice are highly milled the resulting "degermed" cornmeal, patent flour, and polished rice are deprived of the greater part of the compounds of Cu, Fe, Mn, and Zn which appear to be factors in animal nutrition. Some depleted soils may require the addition of Cu, Mn, and Zn in order to restore and maintain productivity and to produce a food supply containing the vital factors in normal proportion.—*F. M. Schertz.*

1043. Miczynski, K. **O dziataniu odczynnika Unverdorben-Franchimont'a i niektorych innych zwiqzkow na krysztaly szczawianu wapnia w roslinach.** [**The effect of the Franchimont reagent and some other compounds on the calcium oxalate crystals of plants.**] Bull. Internat. Acad. Polonaise Sci. et Lett., Cl. Sci. Math. et Nat., Ser. B Sci. Nat. **1923**: 217–223. *Pl. 6–7.* 1923.—The Franchimont reagent, a saturated aqueous solution of cupric acetate, is usually employed as a test for the presence of resinous material in plant tissues, but it does not always produce a specific reaction, since not all resinous materials color under its influence, and since many fatty acids react with it. It is shown from the experiments described that the oxalic acid of plant tissues can react with the copper of this reagent to form cupric oxalate crystals, not in the interior of cells, but in intercellular spaces and tissue rifts. Since these structures form when a bud containing calcium oxalate is placed in cupric acetate solution, and since the calcium oxalate disappears, the author concludes that they are cupric oxalate (CuC_2O_4). They give reactions characteristic for amorphous cupric oxalate, which are detailed.—In laboratory experiments pure crystalline calcium oxalate, upon being treated with cupric acetate solution, completely disappeared and cupric oxalate was formed. In the plant tissues the calcium oxalate crystal dissolves and the oxalic acid diffuses into the intercellular spaces where the cupric oxalate crystals are formed. Patschovsky, in testing for dissolved oxalate in plant tissues, used a solution of ferric sulphate (5 gm. ferric sulphate, 20 cc. acetic acid, 80 cc. water), obtaining as a result, yellow crystals of ferrous oxalate.—*W. J. Himmel.*

1044. Popoff, M[ethodi]. **Zell- und Saatgutstimulation—und die Reiz- und Düngungsverfahren.** [**Cell and seed stimulation. Stimulation and fertilizers.**] Biol. Centralbl. **44**: 458–463. 1924.—On the basis of Bertrand's experiments with catalytic or complementary fertilizers and on his own earlier investigations, the author in this paper demonstrates the stimulative action of artificial fertilizers under certain conditions (with rainfall immediately after application, etc.) The P-, N-, and K-fertilizers in reality manifest a strong cell-stimulative action when used on 1-celled organisms (*Euglena*).—*Author (translated by F. V. Rand).*

1045. [Uspenskii, E. E.] Успенэкий, Е. Е. **К вопросу об изучении действия различных доз железа. Буфферный в отношении железа раствор.** [**Contribution to the study of the action of different quantities of iron. Solution acting as buffer towards iron.**] Труды Научного Института По Удобрениям Выпуск [Trans. Inst. Fertilizers] 23. *1–32.* U. S. S. R. Moscow, 1924.—The modern theory of active reactions and of double unstable combinations throws a new light on the properties of iron. The media used for the experiments have been tested according to the following conditions: (1) The degree of acidity of the medium and the changes in its acidic-buffer action, brought about by addition of a solution of iron salt. It has thus been possible to repeat the experiments of R. Lieske on *Citromyces siderophilus* from which, the author claims, erroneous conclusions were drawn. (2) The variations in the quan-

tity of iron according to different degrees of acidity. (3) The modification of the relation $\frac{Fe^{\cdot\cdot\cdot}}{Fe^{\cdot\cdot}}$ in sunlight as a result of changes in the degree of acidity and in other environmental conditions.—Systematic determinations have been made of the concentration of iron in the natural waters where different types of algae are to be found. Experiments with manganese have established the fact that there are algae which are quite as sensitive as the roots of the higher plants. For optimum conditions of development the majority of organisms require that the concentration of iron should be less than 1 mg. Fe_2O_3 per liter. The injurious effects of iron upon some organisms are already manifested when the concentration is 0.5 mg. Fe_2O_3 per liter. If a higher concentration of iron in solutions is mentioned as being either at an optimum, or acting injuriously, it is usually due to the fact that in such cases the iron is either precipitated in the form of insoluble salts as phosphates or it enters into a complex organic combination (as Raulin's medium). Very often it is not the iron itself that exerts the action, but the acidity produced from the addition of acid salts of iron. Having roughly established the limits of the action of iron, the exact proportion of iron required in different cases can be determined. In the experiments on algae in sunlight, a combination of different proportions of iron citrate with 4/1000 Mol of sodium citrate can be successfully used. In this case all the iron is present in the form of oxides, and its active ions constitute only a small part of the general concentration—about 1:10. A solution acting as a buffer towards iron is thus obtained. This solution is most convenient and furnishes a means of obtaining an entire curve which characterizes the action of iron even upon organisms which are very difficult to cultivate. The concentration of the ferric ion is first of all determined by the accompanying organic matter and not by the general concentration of iron salts. The same principle also applies partly to calcium. When citrates are added, sterilization is indispensable. The addition of 0.00005 Mol citrate to 1 liter of medium diminishes considerably the reaction with KCNS, while a dose 10 times smaller acts also very markedly. For example, at pH 3.4 and with 3 mg. Fe_2O_3 per liter, the following intensities of reaction with KCNS are obtained in the solution: without citrate, 100; with 0.000005 Mol per liter, 80; with 0.00005 Mol per liter, 25.—By acidifying the media used to bring them to a fixed pH value, adding KCNS and comparing the color obtained with those of the scale, the capacity of the medium to act as a buffer towards iron in different soil solutions, as well as in an artificial nutritive media can be determined.—*S. A. Waksman.*

1046. Włodek, Jan. **Badania nad wptywem pory zbioru w dobie na ilosci czesci mineralnych i azotu w lisciach owsa (Avena sativa), koniczyny (Trifolium pratense) i fasoli (Phaseolus vulgaris).** [**Content of ash constituents and nitrogen in leaves of Avena sativa, Trifolium pratense and Phaseolus vulgaris collected at various times of the day.**] Bull. Internat. Acad. Polonaise Sci. et Lett., Cl. Sci. Math. et Nat., Ser. B Sci. Nat. 1923: 65–78. 1923.—Experiments were performed in which the influence of time of day on content of ash constituents and nitrogen in leaves of bean, oats, and clover and the influence of soil nutrition on the possible fluctuation during the day were determined. The amounts of some ash constituents in the leaves showed certain irregularities while those of others were constant. The amounts of SiO_2, SO_3, and Na_2O decreased during the night and again increased during the day. With a deficiency of K_2O in the soil, the amount of Na_2O increased in the leaves during the night. The absolute amounts of Cl and MgO in the leaves remained constant. The amounts of protein N in oats were higher at night; in clover the protein in percentage of total N showed a fluctuation which had a different rhythm from that of SiO_2, SO_3 and Na_2O. Also in clover leaves, the non-protein N showed a rather distinct fluctuation every 4 hours. The amounts of other ash constituents fluctuated more or less iregularly.—*W. J. Himmel.*

PHOTOSYNTHESIS, CHLOROPHYLL

1047. [Aleksandrov, V. G.] Александров, В. Г. **Фотосинтез различных листьев на стебле одного и того жерастения.** [**Photosynthetic activities of different leaves on the stem of the same plant.**] Записки Научно-прикладных отделов Тифлисского Ботанического Сада. Sci. Papers Appl. Sect. Tiflis Bot. Gard. 3: 45–54. 1922–1923.—Using the sunflower, the author determined the photosynthetic activities of leaves at various

heights on the plant by weighing discs cut from the leaves, and determining the differences in the dry weights. The results showed that the upper leaves in almost all cases indicated a higher photosynthetic activity than the lower ones, in spite of the fact that no difference in internal structure was apparent. The greater intensity of the photosynthetic process in the upper leaves is suggested by the author as due to peculiarities in the anatomical structure of the leaves, as for example a larger fibrovascular system.—*L. J. Pessin.*

1048. Harder, R. [Rev. of: Wright, R. C. **An apparatus for determining small amounts of carbon dioxide.** Amer. Jour. Bot. 7: 368–370. 1920. Osterhout, W. J. V. **A demonstration of photosynthesis.** Ibid. 5: 105–111. 1918.] Zeitschr. Bot. **14**: 181–183. 1922.

1049. Krull, Christian. **Betrachtungen zu Reinaus Untersuchungen über die Kohlensäure.** [**The Reinaus investigations on carbonic acid.**] Zeitschr. Pflanzenernahr. u. Düngung **4**: 359–367. 1925.—This is a polemic.—*F. M. Schertz.*

1050. [Liŭbimenko, V. N., and T. B. Forsh.] Любименко, В. Н., и Т. Б. Форш. **К вопросу о физиологической характеристике световых и теневых листьев.** [**The physiological characteristics of light leaves and shade leaves.**] Известия Петроградского Научного Института им. П. Ф. Лесгафта. [Bull. Sci. Inst. P. F. Lesgafta (Petrograd).] **6**: p. 1–12. 1923.—The authors have established the fact that the absolute amount of chlorophyll per surface unit in the shade leaves of a species is less than that in the light leaves; the authors are of the opinion that an increase in the amount of chlorophyll in those shade leaves takes place owing to a greater concentration of pigment in the separate plastids whose relative number decreases at the same time. The most precise unit to be used for comparing the energy of photosynthesis of the light leaves with that of the shade leaves is the weight of the chlorophyll or the relative concentration of the pigment, if not in the separate plastids then at least in the whole layer of green parenchyma. The increase in the dimensions of the plastids in shade-loving plants, recorded by V. N. Liŭbimenko during his previous investigations, was also observed in shade leaves and in the spongy parenchym of light leaves. The author believes that the dimensions of the plastids hold a definite relation to the intensity of illumination.—*Dorochenko.*

1051. Maze, P. **Sur la pluralité des produits de la photosynthèse déduite de l'étude des échanges gaseux entre l'atmosphère et la plante entière.** [**The plurality of the products of photosynthesis deduced from a study of the exchange of gases between the atmosphere and the entire plant.**] Compt. Rend. Acad. Sci. Paris **180**: 306–309. 1925.—This paper is a study of the exchange of gases in the respiration of a fungus, *Eurotiopsis Gayoni*, on different nutrient media, namely, sucrose, lactic acid, glycerin, and ethyl alcohol. This order represents an ascending value for the ratio of H to O which they contain. It is found that the CO_2:O_2 ratio results are in descending order. No such scale obtains with respect to the H:O ratio of the mycelium. A comparison is made with the work of Schloesing in 1893. It is concluded that the photosynthetic ratio exceeds unity. This is consistent with the idea that there are other products of photosynthesis of lower oxygen content than the carbohydrates. The respiration ratio of H:O is concluded to be more than 1:8.—*C. H. Farr.*

1052. Poole, Horace H. **On the photo-electric measurement of submarine illumination.** Sci. Proc. Roy. Dublin Soc. **18**: 99–115. *3 fig.* 1925.—Photoelectric cells may be used in a small vessel at sea by passing the photo-electric current through a known high resistance, the P. D. between the ends of the latter being balanced against a potentiometer. A telephone is used as a detector instead of the galvanometer used by Shelford and Gail. The telephone circuit has an interrupter and a 2-stage valve amplifier. A vacuum photo-electric cell is used as a standard and to record fluctuations in the surface light, while the light below the surface is measured by a cell of the Kunz type. Corrections are made for the effect of obliquity and for loss of light at the front surface of the photometer window. Preliminary tests near Plymouth gave as absorption coefficients per meter for shallow water, values varying from 0.7 on a day when the water was obviously sandy to 0.25 in calm weather.—*W. R. G. Atkins.*

1053. Ruhland. [Rev. of: Osterhout, W. J. V., and A. R. C. Haas. **On the dynamics of photosynthesis.** Jour. Gen. Phys. **1**: 1–16. 1918.] Zeitschr. Bot. **14**: 179–181. 1922.

1054. Schertz, F. M. **Some physical and chemical properties of xanthophyll and the preparation of the pure pigment.** Jour. Agric. Res. **30**: 575–585. *Fig. 1.* 1925.—A detailed

description is given of the preparation and purification of xanthophyll from dried green leaves. Its solubility in petroleum ether (b. p. 50°), absolute alcohol, absolute methyl alcohol and pure anhydrous ethyl alcohol amounts to 9.5, 205.5, 134.9 and 952 mgm. per liter, respectively, at 25°. When kept in an ice box, xanthophyll is unstable in ethyl alcohol solution, very stable in absolute alcohol, and slightly unstable in petroleum ether. In the dry state xanthophyll oxidizes more readily than carotin. In solution it also oxidizes more readily than carotin when kept in an ice box, but the reverse is true when the solutions are exposed to sunlight at room temperature. Apparent inconsistencies, in the literature, are pointed out regarding the behavior of xanthophyll.—*F. M. Schertz.*

1055. Włodek, Jan. **Widmo chlorofilu w zuwum lisciu. [The spectrum of chlorophyll in the living leaf.]** Bull. Internat. Acad. Polonaise Sci. et Lett., Cl. Sci. Math. et Nat., Ser. B Sci. Nat. 1924: 407–423. *Pl. 29.* 1924.—The problem of translocation of the chlorophyll spectrum of a living leaf towards the infra-red when compared with the spectrum of a solution of chlorophyll remains unsolved but, like the effacement of boundaries of the absorption bands, is attributed by the author to the optical system of the tissues of the living leaf. The spectrum of the leaf chlorophyll is probably a mixed spectrum composed of a common with a reflected spectrum intermixed with unabsorbed light. The duality of the 1st absorption band of chlorophyll in the leaf is explained by the assumption that the spectrum of chlorophyll of a leaf is not a spectrum of a mixture of green pigments, but is composed of the distinct spectra of a- and b-chlorophylls covering each other. The spectra of leaf chlorophyll change under the influence of light, perhaps resulting from a quantitative change of ratios of the chlorophylls to each other or from unstable chemical compounds.—*W. J. Himmel.*

METABOLISM (GENERAL)

1056. Anonymous. **Cane molasses a source of vitamins.** [West India Committee Circular]. Australian Sugar Jour. 17: 113. 1925.—The results obtained at the Iowa State College from experiments to determine the vitamin content of molasses, which showed that cane molasses or black strap is richer in vitamin B than the best molasses or sorghum, are regarded as striking confirmation of the view often expressed in the West India Committee Circular, that cane sugar in general and Demerara crystals and Muscovado sugars in particular possess special dietetic value.—*Nellie E. Fealy.*

1057. Aubel, E., et J. Salabartan. **Mécanisme de la production d'hydrogène aux dépens du glucose par le bacille Coli. [The mechanism for the production of hydrogen from glucose by Bacillus coli.]** Compt. Rend. Acad. Sci. Paris 180: 1183–1186. 1925.

1058. Bridel, Marc. **Le primeverose, les primeverosides et la primeverosidase.** Compt. Rend. Acad. Sci. Paris 180: 1421–1423. 1925.—The fresh root of *Primula officinalis* was used. Prinverosidase hydrolyses primverosides into primeverose. Primeverase hydrolyses primeverose into xylose and glucose.—*C. H. Farr.*

1059. Bridel, M., et C. Charaux. **Sur un complexe glucosidique instable de l'écorce de tige de Neprun purgatif (Rhamnus cathartica L.). [The unstable glucosidal complex of Rhamnus cathartica.]** Compt. Rend. Acad. Sci. Paris 180: 857–860. 1925.—This glucosidal complex dissociates in water, yielding many glucosides which upon fermentative hydrolysis yield the primeverose and oxymethylanthraquimonic compounds. To these glucosides is given the name rhamnicoside, which has been obtained in a crystalline form. It is insoluble in water.—*C. H. Farr.*

1060. Bridel, M., et P. Picard. **Sur la préparation et les propriétés du monotropitiside. [The preparation and properties of monotropitoside.]** Compt. Rend. Acad. Sci. Paris 180: 1864–1866. 1925.

1061. Charaux, C. **Sur la datiscine (datiscoside), glucoside du Datisca cannabinna L. et sur ses produits de dédoublement. [Datiscine (datiscoside), the glucoside of Datisca cannabina and the products of its decomposition.]** Compt. Rend. Acad. Sci. Paris 180: 1419–1421. 1925.—The fermentation of datiscine is comparable to that of rutin, datiscine and rutinose are produced, thus $C_{27}H_{30}O_{15} + H_2O = C_{15}H_{10}O_6 + C_{12}H_{22}O_{10}$.—*C. H. Farr.*

1062. Charaux, C., et P. Delauney. **Sur la présence du loroglossiside (loroglossine) dans le Listera ovata R. Br. et L. Epipactis palustris Crantz et sur quelques nouvelles réactions**

de ce glucoside. [The presence of loroglossoside (loroglossine), in Listera ovata and Epipactis palustris and certain of its reactions.] Compt. Rend. Acad. Sci. Paris 180: 1770–1771. 1925.

1063. Craik, James, and Alexander Killen Macbeth. **Studies of the glucosides. Part III. The synthesis of "thioindican."** Jour. Chem. Soc. [London] 127: 1637–1640. 1925.

1064. Dorsey, Henry. **Nitrogen losses in cow's urine.** Jour. Amer. Soc. Agron. 17: 489–492. 1925.—Urine kept in jars during the summer lost less than 50% of its nitrogen. A layer of kerosene reduced the loss of N about 40%. The use of acid phosphate increased the loss of N.—*F. M. Schertz.*

1065. Frater, G. **The composition of ripe wine grapes from the Government viticultural station, Pearl.** Union South Africa Dept. Agric. Sci. Bull. 32. *1–30.* 1924.—Forty-four varieties, all of *Vitis vinifera* parentage, were analyzed at ripening. Percentage of pulp, skin, stalks and seed, weight of bunch and berry, dimensions of berry and number of seed were determined. Separate analyses of pulp, skin, stalks and seed were made, the constituents determined being moisture, sugar, acidity, soluble nitrogenous matter, ash, fibre, and, in the case of the seed, resinous matter and oil. The author concludes that South African grapes, whether recently introduced or long grown in the country, have a higher sugar content than the same varieties grown in France. A bibliography of 65 titles is appended.—*Joseph S. Caldwell.*

1066. Funk, Casimir. **The nomenclature of the vitamines.** Science 62: 157–158. 1925. —The group of substances known as the vitamins should be separated into 2 groups in the light of recently acquired knowledge of them. The group that contains nitrogen and is unstable in the presence of alkalies is to be called vitamins and includes vitamin B (antiberiberi), vitamin C (antiscorbutic), vitamin D (for yeast growth) and possibly a vitamin P (antipellagra). The group that contains no nitrogen and is stable to alkalies is to be called vitasterols and includes vitasterol A (antixerophthalmic), vitasterol E (antirachitic) and possibly a vitasterol F (related to reproduction.)—*C. J. Lyon.*

1067. Gillot, Paul. **Sur les caractéristiques de quelques huiles d'Euphorbiacées. [The characteristics of certain oils of the Euphorbias.]** Compt. Rend. Acad. Sci. Paris 180: 1285–1286. 1925.—The results obtained indicate that *Mercurialis* and *Euphorbia* are not only botanically alike but also physically and chemically, especially as to the fats of their seed. From a practical standpoint these fats resemble linseed oil.—*C. H. Farr.*

1068. Harvey, E. M. **Phloridzin. I. The significance of phloridzin in apple and pear tissue. II. The hydrolysis and estimation of phloridzin.** Oregon Agric. Exp. Sta. Bull. 215. *1–23. 7 fig.* 1925.—I. Large quantities of phloridzin were found in apple and pear shoots in the early summer, coincident with the period of greatest growth activity. Pear shoots uniformly contained about twice as much phloridzin as apple. The amount of this glucoside was greatest at the tip of the shoot and decreased toward the base. The maximum amount in the tip was reached early in the season and decreased toward the end of the season, the maximum phloridzin content lagging behind the maximum growth rate by 1–2 weeks. Possible roles assigned to glucosides by various authors include: (1) As a reserve food material, (2) putting out of action certain harmful by-products of metabolism, (3) protection of certain substances, important to metabolism, from too rapid oxidation by tying them up with glucose, and (4) as antiseptic and protective agents. The observations of the author "led to the general speculative conclusion that the phenol acids, upon which the synthesis of phloridzin depends, are a sort of by-product of metabolic activity, and that phloridzin serves as a protection against an accumulation of these substances or as a temporary repository of them for future use by the tissue." That phloridzin may possibly play a direct rôle as an accelerator of vital processes was suggested by some unpublished observations by S. M. Zeller on the effect of phloridzin on the growth of a certain apple and pear canker fungus.—II. In making the determinations of phloridzin the time of hydrolysis with 2% HCl was reduced from 2½ hours to 15 minutes. With 1% HCl the time should be 20 to 30 minutes. The quantity of material hydrolyzed for estimation of phloridzin should be within a range of 40 to 100 mgm. The inversion procedure usually used (that is, 10 minute treatment at 70°C. with 5 cc. concentrated HCl) causes a slight hydrolysis of phloridzin and introduces an error into total sugars and phloridzin determination. The better procedure in dealing with apple and pear tissues would appear to be inversion by an invertase solution. If the regular inversion is used, conditions should be kept extremely uniform throughout a series of analyses.—*C. E. Owens.*

1069. Herissey, H. **Sur l'aspéruloside, glucoside nouveau retiré de l'Aspérule odorante. [Asperuloside, a new glucoside from the sweet-scented asperula.]** Compt. Rend. Acad. Sci. Paris **180**: 1695–1697. 1925.

1070. Honeywell, Edna M., and H. Steenbock. **The synthesis of vitamin C by germination.** Amer. Jour. Physiol. **70**: 322–332. 1924.—During the process of germination in the dark, barley synthesizes vitamin C, as shown by the usual feeding tests on guinea pigs. Soaking the seed for 24–96 hours without access of O_2 is insufficient to produce the vitamin, so that O_2 appears necessary for this synthesis in the germinating barley.—*Ernest S. Reynolds.*

1071. Jonesco, St. **Action combinée de l'acide chlorhydrique et du sodium métallique sur le rougissement d'un flavone extrait des feuilles rouges de Prunus Pissardi. [The combined action of hydrochloric acid and metallic sodium on the reddening of the flavone extracted from the red leaves of Prunus Pissardi.]** Compt. Rend. Acad. Sci. Paris **180**: 1361–1363. 1925.—As a result of these experiments it is concluded that it is neither nascent hydrogen nor metallic sodium alone which produces the red pigmentation of the chromogen. The coloration appears only in the presence of the acid.—*C. H. Farr.*

1072. Jonesco, St. **L'action des acides minéraux et organiques combinée à celle du sodium métallique sur le rougissement de quelques flavones. [The action of mineral and organic acids, combined with that of metallic sodium on the reddening of certain flavones.]** Compt. Rend. Acad. Sci. Paris **180**: 1523–1525. 1925.—The red leaves of *Prunus Pissardi* were used in this study. It is shown that quercitine is reduced to an uncolored pseudo-base which is acted on by HCl to give the red pigment, a chlorid of cyanidine, which is, however, not an anthocyan.—*C. H. Farr.*

1073. Kitasato, Zenjiro. **Biochemische Studien über Phycoerythrin und Phycocyan. [Biochemical studies on phycoerythrin and phycocyan.]** Acta Phytochimica **2**: 75–97. *Pl. 6–8.* 1925.—The author obtains from the water extract of *Porphyra tenera* Kjellm. crystalline phycoerythrin and phycocyan by salting out with ammonium sulphate. Both substances can be split by acids, alkalies, or proteolytic enzymes into a protein component and a color substance. Phycoerythrin and phycocyan purified by repeated crystallizations and dialysis have the following empirical formulae: for phycoerythrin C 50.87, H 7.04, N 15.34, S 1.76, and 024.99; for phycocyan C 50.60, H 6.90, N 15.76, S 1.69, O 24.97. All the reactions, including solubility, precipitation with salts, and distribution of amino nitrogen, indicate that the protein component belongs to the globulins. Only the cystine content is somewhat greater. There seems to be no difference in the protein component of phycoerythrin and phycocyan. Phycoerythrin when digested with pepsin yields a red-violet substance which on treatment with acids is further split into an amino acid complex and the real blue color component. Phycocyan on the other hand, is split directly into a protein component and a blue color complex without yielding any intermediate red-violet product. The difference is located in a basic amino constituent which in phycoerythrin is joined directly to the blue color substance. The latter is insoluble in water, but soluble in organic solvents and is not a pyrrol derivative like chlorophyll. Spectraphotographic studies have been made of phycoerythrin, phycocyan and their products and plates are included showing photographs of the absorption bands. These indicate the identity of the color component in the 2 pigments and their similarity except for the basic amino complex in phycoerythrin. The constitution of the color molecule requires further investigation.—*C. M. Conrad.*

1074. Koch, Elizabeth M., and F. C. Koch. **The presence of trehalose in yeast.** Science **61**: 570–572. 1925.—Trehalose has been extracted from compressed yeast and separated from the alcoholic extract in crystals. A detailed statement is made of the tests and methods used. Its function in yeast is being investigated.—*C. J. Lyon.*

1075. Lapworth, Arthur, and Edward Neville Mottram. **Oxidation products of oleic acid. Part I. Conversion of oleic acid into dihydroxystearic acid and the determination of the higher saturated acids in mixed acids from natural sources.** Jour. Chem. Soc. [London] **127**: 1628–1631. 1925.

1076. Legg, Vernon Howes, and Richard Vernon Wheeler. **Plant cuticles. Part I. Modern plant cuticles. Studies in the composition of coal.** Jour. Chem. Soc. [London] **127**: 1412–1421. *4 fig.* 1925.—This work was done with cuticle from *Agave americana.* The crude

material was extracted with solvents and the following 4 classes of compounds were obtained: (1) Water soluble material; (2) wax, soluble in alcohol, benzene, and chloroform; (3) cellulose, soluble in cuprammonia; and (4) a residue, insoluble in the solvents used, which was regarded as the characteristic constituent of the cuticle and which was called cutin. More than 90% of this cutin dissolved in alcoholic potash, the resulting substances being chiefly 2 semi-liquid organic acids not hitherto reported as occurring in nature, one, for which the name cutic acid is suggested, has the formula $C_{26}H_{50}O_6$, the other, called cutinic acid, gave analytical data in agreement with the formula $C_{13}H_{22}O_3$. Two other acids, one corresponding to the formula for phloionic acid ($C_{19}H_{38}O_6$), and the other closely related to phellonic acid, were found. Microchemical tests were also made. Sudan III, a reagent commonly used for detecting fats and waxes, stained cutin even after long continued treatment with fat and wax-removing solvents.—*F. E. Denny.*

1077. McHargue, J. S. **The association of copper with substances containing the fat-soluble A vitamin.** Amer. Jour. Physiol. 72: 583–594. 1925.—Quantitative determinations of copper in animal substances rich in vitamin A and in the embryos of corn and wheat, indicate a greater accumulation of this element in association with vitamin A than elsewhere in plant and animal bodies. Maguenne and Demoussy indicated also more copper in young vegetative shoots than in mature ones, which also associates it with sources of vitamin A. The author concludes that copper has "important biological functions . . . . in the normal metabolism of plants and animals."—*Ernest S. Reynolds.*

1078. Maige, A. **Methodes diverses d'appreciation du niveau du seuil de condensation amylogène.** [Various methods for the determination of the threshold of starch condensation.] Compt. Rend Acad. Sci. Paris 180: 1428–1431. 1925.—Different methods have been published for the studying of the threshold of starch condensation in different plastids of 1 cell, or in different cells. Four methods are here described; 3 of them are new.—*C. H. Farr.*

1079. Malkin, Thomas, and Robert Robinson. **A synthesis of pyrylium salts of anthocyanidin type. Part VIII. A new synthesis of pelargonidin chloride and of galanginidin chloride.** Jour. Chem. Soc. [London] 127: 1190–1195. 1925.

1080. Michel-Durand, E. **Sous quelle forme existent les tannins chez les Spirogyres.** [The nature of the tannins of Spirogyra.] Compt. Rend. Acad. Sci. Paris 180: 460–462. 1925.—As a result of quantitative study of the tannins of *Spirogyra* it is shown that in 11,800 mg. fresh weight, or 1,200 mg. dry weight, there are 35 mg. of tannins soluble in acetone, and 1 mg. of tannins soluble in water. In this same quantity there are 50 mg. of carbohydrates soluble in acetone, and 370 mg. easily hydrolysable. This ratio is confirmed by cytological examination.—*C. H. Farr.*

1081. Mirande, Marcel. **Sur la phytostérine des écailles des bulbes dans les espèces du genre Lilium.** [Phytosterine of the bulb scales of species of Lilium.] Compt. Rend. Acad. Sci. Paris 180: 1768–1771. 1925.—Vacuolar stain increases with the age of the scales and reaches a maximum at desiccation or withering. It does not play the role of a reserve food, but of defense and also protects the scales against rapid desiccation.—*C. H. Farr.*

1082. Morgan, Agnes Fay. **Biological food tests. VIII. Vitamins A and B in radish.** Amer. Jour. Physiol. 69: 634–637. 1924.—By feeding experiments with young rats it was shown that dried radishes contain little or no vitamin A, but a quantity of vitamin B almost equivalent to that of fresh cows milk or of orange juice. The red color of radishes is an anthocyan and the lack of vitamin A supports the hypothesis that this vitamin is not associated with anthocyan but is with carotinoid pigments. Beets have been shown by other workers to be essentially free from the vitamin.—*Ernest S. Reynolds.*

1083. Morgan, Agnes Fay, and Lillias D. Francis. **Biological food tests. VII. The vitamin A and B content of fresh and dehydrated pumpkin.** Amer. Jour. Physiol. 69: 67–77. 1924.—"Pumpkin, dehydrated at a low temperature for a long period of time, with a large volume of air constantly passing through the dryer, appears to suffer only a slight loss of vitamin B," thus differing from former experience with dried globe artichoke. It has high vitamin A potency, which is correlated with a high lipochrome content. Its vitamin B value is determined as varying from $\frac{1}{6}$ to $\frac{1}{3}$ that of dried brewery yeast, as tested on both mice and rats. Fresh pumpkin is rated by similar tests at about $\frac{1}{4}$ the value of dried brewery yeast.

The value of uniform feeding procedure is suggested by a comparison of the vitamin A and B values of different foods.—*Ernest S. Reynolds.*

1084. Mueller, J. Howard. **Chemical studies on tuberculin.** Proc. Nation. Acad. Sci. [U. S. A.] **11**: 23–25. 1925.—Other workers have shown that extracts of tubercle bacilli and other pathological bacteria, after purification from proteins, are capable of producing specific skin or precipitin reactions. The author finds that such extracts contain 1–3% of nitrogen in the dried material, but give no clearly positive color tests for protein. A yeast gum was prepared in considerable quantities; it gave a specific precipitation reaction with anti-yeast serum, and this seemed to be due to carbohydrate. With tuberculin, a fraction with little nitrogen gave a specific precipitin reaction, but not a skin reaction, in high dilution; another fraction gave the reverse results with these tests.—*Howard B. Frost.*

1085. Munerati, O. **Variations dans la composition du jus d'une betterave suivant l'état de désintegration du tissu et des procédés de pression.** [**Variations in the composition of beet juice following disintegration of its tissue, and compression.**] Compt. Rend. Acad. Sci. Paris **180**: 1176–1178. 1925.—It is concluded that it is absolutely necessary to extract the juice of a standardized pulp.—*C. H. Farr.*

1086. Murray, Humphrey Desmond. **The composition of starch iodide.** Jour. Chem. Soc. [London] **127**: 1288–1294. 1925.—" . . . . it is suggested that an addition compound is formed by the starch, the anion of which in dilute potassium iodide solutions, has the formula $(C_6H_{10}O_5)_nI_5$, where $_n$ is approximately 15 . . . . ."—*From author's statement of result.*

1087. Noack, K. **Physiologische Untersuchungen an Flavonolen und Anthocyanen.** [**Physiological investigations on flavonols and anthocyans.**] Zeitschr. Bot. **14**: 1–74. 1922.—Since there should be an anthocyan possible for every flavonol by reduction of the latter, the nature of these 2 compounds when they occurred in the same plant parts was studied. Similar solubilities in amyl alcohol are taken as indicating that similar sugars are involved in both types of glucosides where found together. The character of the aglukon (non-sugar) part of the molecules was not determined. Evidence is given that flavonols are not reduced to form anthocyans so long as normal photosynthesis, that is, reduction of CO_2, takes place. This view explains all cases of anthocyan formation except for normally red leaves, and supports the hypothesis that the anthocyan-flavonol couple is an oxidation-reduction device.—Perianth segments of *Victoria* and *Cobaea* which color in darkness as well as light show no flavonol until it appears with the anthocyan; but *Hydrangea* flowers which require light for coloring seem to have the flavonol already present.—Anthocyans are not affected by emulsin but are hydrolyzed to the aglukon and sugar by Aspergillus tannase. The reaction seems to be mono-molecular. Certain flavonols are also split by tannase. Some evidence is presented that tannins may be chemical links between anthocyans and phloroglucin tannins.—*P. B. Sears.*

1088. Polonowski, Michel. **La synthese organique dans le monde végétal.** [**Organic synthesis in the plant kingdom.**] Bull. Soc. Chim. Biol. **7**: 526–590. 1925.—This is a review of literature. A bibliography of 182 titles is appended.—*Joseph S. Caldwell.*

1089. Pozerski, E. **Sur l'excrétion de composés phosphorés par les microbes.** [**The excretion of phosphorous compounds by microorganisms.**] Compt. Rend. Soc. Biol. **91**: 1004–1005. 1924.—It has been previously reported that *Proteus vulgaris* and the Shiga bacillus excrete phosphorus compounds while alive. Similar studies give positive results for Flexner's bacillus, the dysentery bacillus Y, the typhoid bacillus, paratyphoid bacilli A and B, *Bacillus coli*, *Staphylococcus aureus*, and *Staph. albus*.—*Oran Raber.*

1090. Pratt, David Doig, and Robert Robinson. **A synthesis of pyrylium salts of anthocyanidin type. Part VI. Polyhydroxyflavylium salts related to chrysin, apigenin, lotoflavin, luteolin, galangin, fisetin and morin.** Jour. Chem. Soc. [London] **127**: 1128–1138. 1925.

1091. Pratt, David Doig, and Robert Robinson. **A synthesis of pyrylium salts of anthocyanidin type. Part VII. The preparation of the anthocyanidins with the aid of 2:4:6 triacetoxybenzaldehyde.** Jour. Chem. Soc. [London] **127**: 1182–1190. 1925.

1092. Schertz, F. M. **Some physical and chemical properties of carotin and the preparation of the pure pigment.** Jour. Agric. Res. **30**: 469–474. 1925.—The solubility of carotin in absolute alcohol, petroleum ether (b. p. 30–50°), and specially purified ethyl alcohol amounts

to 15.5, 626, and 1.005 mgm. per liter, respectively, at 25°C. Solutions of carotin in absolute alcohol and petroleum ether are extremely stable when kept in an ice box, but ethyl alcohol solutions decompose rapidly under the same conditions. Crystals of carotin may be stored in alcohol or petroleum ether in open containers for some time without oxidation and may be stored permanently in these solvents if sealed in ampules. A yield of 1.13 gm. of pure carotin (m. p. 174°) per bushel of carrots was obtained. The method is described for the preparation of carotin on a small scale.—*Author.*

1093. Sherwood, Sidney F. **Composition of sugar-beet pulp and tops and of silage therefrom.** U. S. Dept. Agric. Dept. Circ. 319. *1–11.* 1924.—Brief discussion and tables.—*L. R. Hesler.*

1094. Terroine, Emile-F., S. Trautmann, et R. Bonnet. **Loi bioénergique quantitative de la formation des hydrates de carbone aux dépens des proteiques et des graisses chez les végétaux. [The quantitative bioenergic law for the formation of carbohydrates from protein and from fats in plants.]** Compt. Rend. Acad. Sci. Paris **180**: 1181–1183. 1925.—It is concluded that in plants the transformation of proteins into carbohydrates is accompanied by a loss of 35% of metabolic energy; their formation from fats, by a loss of 23%.—*C. H. Farr.*

1095. Terroine, Emile-F., S. Trautmann, et R. Bonnet. **Rendement énergétique dans la croissance des microorganismes en fonction de la concentration des substances nutritives du milieu et consommation de luxe. [Energy relations in the growth of microörganisms as a function of the concentration of nutritive substances in the culture media.]** Compt. Rend. Acad. Sci. Paris **180**: 2060–2063. 1925.—The results show that the concentration of nutritive substances in the media may vary in the proportion of 1–6 (in relation to a standard adopted) for the bacillus of Phleole, and 1–15 for *Sterigmatocystis nigra*, the energy utilization for growth remaining exactly the same. This indicates that the metabolism of the cell is not modified by the concentration of food available.—*C. H. Farr.*

1096. Terroine, Emile-F., S. Trautmann, R. Bonnet, et R. Jacquet. **L'energie de croissance. IV. Le rendement energetique des divers glucides dans la croissance des végétaux supérieurs. [The energy of growth. IV. The energy yield of various sugars for the growth of higher plants.]** Bull. Soc. Chim. Biol. **7**: 461–473. 1925.—The work here reported was undertaken in order to determine the extent to which a young plant can utilize foodstuffs chemically unlike those stored in the seed. The peanut was chosen as a typical fatty seed with a small, readily detachable embryo. The embryos, after removal and sterilization in $HgCl_2$, were emplanted in tubes of a nutrient salt solution solidified by addition of gelose and containing 2% of sugar as the only organic nutrient, and grown at 30°C. in the dark. The series upon arabinose, xylose, lactose, and galactose made no growth, those upon dextrose, levulose, saccharose, and maltose made quite uniform and vigorous growth. From 67 to 75% of the energy of the carbohydrate consumed was utilized for growth, as compared with 53% utilization of the fats of the peanut seed. The utilization of carbohydrate is equal to that observed in starchy seed such as sorghum and rice. There is consequently no obligate relationship between the embryo and the chemical nature of the foodstuffs of the seed, as the young plant can utilize either carbohydrate or fat equally well as a source of carbon, but with an energy yield characteristic of the material employed. The conclusions of Terroine and his associates that the specific yield of various foodstuffs is a constant regardless of the botanical classification of the plant employed are therefore confirmed. (See also Bot. Absts. 13, Entries 3088, 7968; 14, Entry 9514.)—*Joseph S. Caldwell.*

1097. Thomas, P., and C. Berariu. **La recherche des pentoses combinés dans les nucléoprotéides. [Pentoses combined in nucleoproteids.]** Compt. Rend. Soc. Biol. **91**: 1470–1471. 1924.—Above a few cc. of 3% B-naphthol in concentrated H_2SO_4 is placed about 1 cc. of the solution to be tested. If a pentose is present, either free or combined, a blue ring appears at the interface. This method is found to apply to pentoses present in nucleic acids and in nucleoproteins.—*Oran Raber.*

1098. Tollenaar, Dirk. **Omzettingen van koolhydraten in het blad van Nicotiana tabacum L. [Carbohydrate metabolism in the foliage leaves of Nicotiana tabacum L.]** Lab. Landbouw-Scheikunde Lab. Plantenphysiol. Onderzoek 12. *1–142. Fig.. 1–9.* H. Veenman & Zonen: Wageningen, 1925.—A series of studies is made on carbohydrate formation and de-

composition in the leaves of tobacco. The formation of starch was studied in the normal plant and in leaves in sugar solution. It is believed that a monose sugar is the 1st detectable step in photosynthesis, that in most instances the process leads immediately to the formation of starch, and that much of the starch is used directly in respiration rather than being transported. The effect of tobacco mosaic on the conversion of starch is discussed. The application of the experimental results to the curing of tobacco is discussed and it is pointed out that leaves in dry air lose their starch more rapidly than those kept in moist air after removal from the plant.—*A. F. Camp.*

METABOLISM (NITROGEN RELATIONS)

1099. Bristol, Pearl. **Growth of B. botulinus in 30% peptone. XVII. With notes on Van Slyke's amino nitrogen method for study of bacterial metabolism.** Jour. Infect. Diseases 36: 457–471. *Fig. 1.* 1925.—The organism grew more rapidly and reached greater numbers in a 25% than in a 2% peptone medium. Practically equivalent amounts of toxin were formed in both media during equal periods of incubation. As a result of the growth of *Bacillus botulinus* the medium becomes slightly acid due to organic acids produced. There is a decided decrease in the protein and peptid N and an equivalent increase in ammonia N.—*R. L. Starkey.*

1100. Combes, Raoul. **Migration des substances azotées des feuilles vers les tiges au cours du jaunissement automnal. [The migration of nitrogen compounds of leaves to the stem during autumnal yellowing.]** Compt. Rend. Acad. Sci. Paris 180: 2056–2058. 1925.—*Castanea vulgaris* and *Fagus silvatica* were used. Nitrogen determinations are given for the various leaves and parts of the stem of green and yellowed specimens. The stems of detached branches show a greater increase of nitrogen with yellowing than do those on the tree. The lower leaves lose more than the upper.—*C. H. Farr.*

1101. Ecker, E. E., and J. L. Morris. **Factors influencing the destruction of uric acid by aerobacter aerogenes.** Jour. Infect. Diseases 35: 479–488. 1924.—Five strains of *Aerobacter aerogenes*, developing in Koser's medium containing uric acid as the single source of nitrogen, decomposed 19, 12, 44, 17, 12, and 11% of the acid respectively in 48 hours at 37°C. Utilization of uric acid was increased by the presence of sodium citrate, sodium oxalate, sodium tartrate, and sodium lactate. Amino acids, ammonium salts, and glucose inhibited its destruction without inhibiting growth. Sodium bicarbonate inhibited growth of the organism, but tended to break down uric acid chemically.—*R. L. Starkey.*

1102. Fred, E. B. **The influence of nitrifying bacteria on the growth of barley.** Soil Sci. 18: 323–325. *Pl. 1–2.* 1924.—Barley plants were grown in sand cultures, supplied a modified Shive's nutrient solution in 3 groups, (1) control, no. N, (2) N as $(NH_4)_2SO_4$, (3) N as $(NH_4)_2SO_4$ and inoculated with the nitrifying bacteria *Nitrosomonas* and *Nitrobacter* 2 weeks before planting. The average green weights of the plants per jar at the end of 102 days were: (1) 1.5 gm., (2) 66.5 gm., (3) 116.0 gm. A 2nd experiment gave results just as significant. There was an increase in the total N of the barley plants grown with nitrifiers.—*C. G. Deuber.*

1103. Jodidi, S. L. **Physiological studies on cereals. II. The occurrence of amino acids and polypeptides in the ungerminated oat kernel.** Jour. Franklin Inst. 198: 201–211. 1924.—After removing all forms of organic nitrogen except amino acids and polypeptides, hydrolysis with HCl resulted in an increase in the amino acid content, thus demonstrating the presence of peptides as well as amino acids. The analytical results are given in detail.—*Ernest S. Reynolds.*

1104. Kostytschew, S., and A. Ruskaltchouk. **Les produits de la fixation de l'azote atmosphérique par l'Azotobacter agile. [The products of atmospheric nitrogen fixation by Azotobacter agile.]** Compt. Rend. Acad. Sci. Paris 180: 2070–2072. 1925.—These experiments lead to the conclusion that *Azotobacter* constructs ammonia by direct reduction of molecular nitrogen. This involves the action of very powerful reducing ferments, for it is identical with the industrial process of Haber, which involves high temperatures, high pressures and metallic catalyzers. *Azotobacter* utilizes the ammonia for the construction of amino acids. The reduction of nitrates by fungi gives the same products.—*C. H. Farr.*

1105. Lipman, C. B., and J. K. Taylor. **Do green plants have the power of fixing elementary nitrogen from the atmosphere?** Jour. Franklin Inst. 198: 475–506. 1924.—Wheat and

barley grown in a modified Shive's solution, open to the atmosphere, accumulated N from the atmosphere when nitrates were supplied in small amounts or not at all. Experiments by Mameli and Pollacci are thus substantiated. Experimental evidence and logical arguments are presented to show that the presence of bacteria does not invalidate the results. Peas under these experimental conditions demonstrated no power of fixing N and *Bromus* fixed less than wheat and barley. In one series where ammonia and nitrous acid were excluded from the atmosphere, fixation of N also took place, thus demonstrating elementary N fixation. Gains of N from less than 1% to 50% by dry weight occurred, depending somewhat upon the amount of NO_3 supplied in the original solution, less N fixation taking place when larger amounts of NO_3 were used.—*Ernest S. Reynolds.*

1106. Nicolas, E., et G. Nicolas. **L'hexaméthylénetetramine est bien un aliment pour les végétaux. Nouvelles rechereches sur le haricot et la moutarde blanche. [Hexamethylenetetramine a plant nutrient.]** Compt. Rend. Acad. Sci. Paris **180**: 860–861. 1925.—The data here given on the white mustard confirm the authors' previous finding with regard to the bean, namely, that hexamethylenetetramine exerts a favorable influence on the development of the leaves in surface area. It also shows that this material in doses of 0.1–0.3 gm. per liter is favorable for the production of dry matter.—*C. H. Farr.*

1107. Perkins, Alfred T. **The effect of several mineral fertilizers upon the nodulation of Virginia soybeans.** Soil Sci. **17**: 439–447. 1924.—The effect on nodulation of 4 elements (Ca, K, Na, and P) essential for plant growth, was studied. The elements were applied as $CaCO_3$, KCl, $NaNO_3$ and acid phosphate, under laboratory conditions. The author concludes that elements essential for plant growth do not directly affect the infection and nodulation of legumes.—*W. E. Maneval.*

1108. Perkins, Alfred T. **A note on the nodulation of soy beans.** Soil Sci. **17**: 449–456. 1924.—In a former paper the results of greenhouse experiments indicated that elements essential for plant growth do not directly affect nodulation of legumes. Under agricultural conditions these elements do favor nodulation. In this paper results of experiments to explain the difference are reported. It is concluded that under field conditions P and K may increase nodulation by overcoming toxicity and that Ca may act in several ways, while in pot experiments there was a disturbance of physiological activities of the plants.—*W. E. Maneval.*

1109. Prjanischnikow, D. N. **Zur physiologischen Charakteristik von Ammoniumnitrat. [The physiological characteristics of ammonium nitrate.]** Zeitschr. Pflanzenernähr. u. Düngung **4**: 242–250. 1925.—This is a study of the action of ammonium nitrate as a fertilizer.—*F. M. Schertz.*

1110. Schwartz, C. **Die ernährungsphysiologische Bedeutung der Mikroorganismen in den Vormägen der Wiederkäuer. [The physiological significance of microörganisms in the antestomach of ruminants.]** Biochem. Zeitschr. **156**: 130–137. 1925.—The N content of the stomach contents of ruminants was determined. Bacteria contained 8.1–17.5% of the total and infusoria 18.3–21.5%.—*H. D. Hooker.*

1111. Truffaut, Georges, et N. Bezssonoff. **Des Maïs se développent normalement en n'utilisant que l'azote fixé par des Bactéries. [Corn develops normally when using only nitrogen fixed by bacteria.]** Compt. Rend. Soc. Biol. **91**: 1077–1078. 1924.—In the presence of nitrogen-fixing bacteria 2 cultures of corn developed normally to maturity when deprived of nitrogen and organic matter. The secretions from the roots furnished all the organic matter necessary for the nitrogen-fixing bacteria.—*Oran Raber.*

METABOLISM (ENZYMES, FERMENTATION)

1112. Arnold, L., and E. Weiss. **The Twort-d'Herelle phenomenon. The resemblance of bacteriophage to toxins and ferments.** Jour. Infect. Diseases **35**: 603–609. 1924.—Further studies are reported as evidence indicating the bacteriophage to be of the nature of toxins, lysins, and ferments as opposed to its being a living ultramicroscopic organism. Salt solution extracts of alcohol-precipitated bacteriophage could regenerate the bacteriophage, transmit it and produce antibodies. Bacteriophage inactivated by heat stimulates antibody formation and neutralizes antibacteriophage serum. Antibacteriophage bodies may be salted out from antiserum with the euglobulin fraction.—*R. L. Starkey.*

1113. Bridel, M., et C. Charaux. **Sur le processus du noircissement des Orobanches au cours de leur dessiccation. [The process of blackening in Orobanches during drying.]** Bull. Soc. Chim. Biol. **7**: 474–485. 1925.—In a large number of plants (*Melampyrum* spp. *Rhinanthus*, *Monotropa*, the pear) blackening during desiccation is due to the splitting of a glucoside, aucuboside (aucubin), by emulsin. The authors examined *Orobanche amethystea* Thuill., *O. cruenta* Bert., *O. epithymum* D. C., *O. minor* Sutl., and *O. Picridis* Schultz for the presence of aucubin by subjecting aqueous extracts successively to the action of invertin and emulsin. All the extracts contained considerable amounts of sucrose, but no glucoside hydrolyzable by emulsin. The authors consequently examined members of the family for the presence of other glucosides, finding one which they name orobanchoside. Its physical properties are described in detail. On acid hydrolysis it yields rhamnose and dextrose in equimolecular proportions; on hydrolysis with alkali it yields caffeic acid. A glycerin extract of *Russula delicia* or of Orobanche stems or tubers produces an intense blue-black coloration in a solution of the pure glucoside. The action is one of oxidation, not of hydrolysis.—*Joseph S. Caldwell.*

1114. Bridel, M., et C. Charaux. **Sur le processus du noircissement des Orobanches au cours de leur dessiccation. [The process of blackening in Orobanches during drying.]** Compt. Rend. Acad. Sci. Paris **180**: 387–388. 1925.—(See preceding Entry.)

1115. Bridel, M., et C. Charaux. **Les produits de l'hydrolyse fermentaire du rhamnicoside: Primeverose et rhamnicogend. La repartition du rhamnicoside dans le genre Rhamnus. [Products of enzymic hydrolysis of rhamnicoside: Primeverose and rhamnicogenol. The distribution of rhamnicoside in the genus Rhamnus.]** Bull. Soc. Chim. Biol. **7**: 822–830. 1925.—Continuing this series, the authors hydrolyzed rhamnicoside by the addition of dry powdered extract of *Cornus sanguinea*. As both are insoluble in water, they were mixed intimately, covered with water, and kept at 33°C. Primeverose and rhamnicogenol were isolated from the products of hydrolysis and the properties of the latter, which is a pentahydroxymethylanthranol, were determined. Rhamnicoside is present in the bark of *Rhamnus cathartica*, *R. infectoria*, *R. utilis*, *R. saxatilis*, *R. oleoides*, and *R. italicus;* it is absent in *R. frangula*, *R. Alaternus*, *R. alpina*, *R. japonica*, *R. Billardii* and *R. imeretina.*—*Joseph S. Caldwell.*

1116. Bridel, M., et C. Charaux. **Les produits de l'hydrolyse fermentaire du rhamnicoside: Primeverose et rhamnicogenol. [Products of enzymic hydrolysis of rhamnicoside: Primeverose and rhamnicogenol.]** Compt. Rend. Acad. Sci. Paris **180**: 1219–1222. 1925. (See preceding Entry.)

1117. Coupin, Henri. **Sur les peroxydases dans les graines sèches. [The peroxidases of dry seed.]** Compt. Rend. Acad. Sci. Paris **180**: 685–687. 1925.—The benzidine-water-oxygen reactions reveals the presence of peroxydases in great abundance in many, but not all, dry seed, that is, there is a state of latent life. They are located in the aleurone layer, embryo, cotyledons, and albumen.—*C. H. Farr.*

1118. Dubois, Raphael. **Sur le mode d'alimentation des Broméliacées sans racines. [Mode of nutrition of the rootless Bromeliads.]** Compt. Rend. Acad. Sci. Paris **180**: 1050–1051. 1925.—These Bromeliads secrete a gum which contains amylase and trypsin. These enzymes digest animals and organic material caught in the gum. A special study is made of *Tillandsia dianthoides*. On its scales are found small receptacles in which are found amorphous and crystalline mineral matter, and also some of the lower fungi, as yeasts, bacteria, and spores.—*C. H. Farr.*

1119. Fleury, P. **Recherches sur la laccase. V. Action de l'acide cyanhydrique. La relation avec la réaction du milieu. [Researches on laccase. V. Action of hydrocyanic acid. Its relation to the reaction of the medium.]** Bull. Soc. Chim. Biol. **7**: 797–805. 1925.—The experiments were carried on under such conditions that loss of HCN from the solution to the air was avoided by maintaining a constant partial pressure of HCN in the air of the chamber. The activity of laccase is decreased by HCN, the amount of decrease being a logarithmic function of the concentration, as already found to be the case with NaCl (see Bot. Absts. 14, Entry 7494). The depressant effect of HCN is most marked at the pH concentration which permits maximum action of laccase in absence of HCN, and is very much less marked at pH 4.5 and 9, at which points laccase activity is greatly reduced.—*Joseph S. Caldwell.*

1120. Kushner, Irving, and Alex. S. Chaikelis. **Retardation of the action of oxidases by bacteria.** Science 62: 36–37. 1925.—The oxidases in milk are prevented from oxidising a 1% solution of guaiac to guaiac blue by the presence of a large number of bacteria. However the 1st increases in the bacterial count up to about 3 millions per cc. induce a slight accelertion of the rate of the oxidation.—*C. J. Lyon.*

1121. McLeod, James Walter. **Bacterial catalase.** Science 61: 630. 1925.—Brief reference is made to the important points in the literature on catalase in bacteria, to bring out the fact that, contrary to the statements of Harvey (Science Nov. 21, 1924), the absence of catalase from the alga *Phormidium Laminosum* is not the 1st instance of its absence from an organism, since in some bacteria it is also absent. The lactic acid bacteria are notable examples of such forms.—*C. J. Lyon.*

1122. Novy, F. G., and M. H. Soule. **Microbic respiration. II. Respiration of the tubercle bacillus.** Jour. Infect. Diseases 36: 168–232. *Fig. 1–15.* 1925.—A single strain of human *Bacillus tuberculosis* was studied. The respiratory quotients of the organism developing on nutrient agar reinforced with glycerol, glucose, and serum were 0.836, 0.992, and 0.904, respectively. On glycerol the organism produced practically no alkali, on glucose considerable, and on serum a large proportion of the CO_2 was fixed by bases formed by the break-down of proteins contained in the medium. There was no development on plain nutrient agar. The respiratory quotient was not affected appreciably by high or low oxygen tension or high tension of CO_2. Extensive growth of the organism can be obtained in 14 days on a good medium if the requirements for oxygen and moisture are satisfied. An actively growing test tube culture can consume all the oxygen from about $\frac{3}{4}$ of a liter of air; a fair growth may develop when restricted to 250 cc.; slight growth develops in 90 cc.; but no apparent growth occurs in 40 cc. of air. Closing tubes with sealing wax prevents desiccation of the medium. The insertion of small capillary tubes or opening of small holes through the wax with a hot wire permit circulation of air to satisfy the demands of the organism for oxygen. Practically no growth develops where the tube is closed tightly with sealing wax, paraffin, or rubber stoppers. Active cultures could readily use oxygen present in concentration of 98%. Growth was rapid in concentrations of 40, 60, 80, and 93% of oxygen, slower, however, in the last 2 concentrations. The rate of growth decreased progressively as the oxygen tension was lowered to 0.5% from that of normal air (20.93%), even though the total amounts of oxygen present in the culture containers was approximately the same. The optimum oxygen concentration appeared to be close to 50%. Cultures developed well up to 60% CO_2 and grew slowly in 80 and 90% CO_2. This gas is not essential to growth. Alkali around the culture container does not depress growth directly, nor by absorption of CO_2, but by its desiccating action on the culture medium. When the atmosphere is kept quite moist, growth is more rapid and extensive. The presence of mercury in the growing chamber either inhibits growth completely or retards it, in which case the growth becomes dirty black in color due to the formation of HgS. From the experiments on retardation of growth in lowered oxygen tension it is postulated that the inhibition to rapid proliferation in animal tissues is associated with low oxygen tension and that beneficial effects of rest cures and rich diet may be explained largely by the inhibitive effects of reduced oxygen tension.—*R. L. Starkey.*

1123. Pictet, Amé, Werner Scherrer, et Louis Helfer. **Sur la présence de l'argon dans les gaz de la fermentation alcoolique du glucose. [The presence of argon in the gas from the alcoholic fermentation of glucose.]** Compt. Rend. Acad. Sci. Paris 180: 1629–1632. 1925.—The authors believe that they have demonstrated the liberation of argon from the alcoholic fermentation of glucose.—*C. H. Farr.*

1124. Semichon, Lucien. **Action de l'alcool sur la faculté élective des levures dans la fermentation des moûts de raisin. [The action of alcohol on the elective faculty of yeasts in the fermentation of grape juice.]** Compt. Rend. Acad. Sci. Paris 180: 1292-1294. 1925.

1125. Underwood, H. W., Jr. **Studies in catalysis.** Proc. Nation. Acad. Sci. [U. S. A.] 11: 78–80. 1925.—The author reports experimental results supporting the hypothesis that stabilizers, or inhibitors of the decomposition of unstable substances, are "true negative catalysts," acting by the formation of molecular compounds with the unstable substance. Many substances have been tested as stabilizers of chloroform, and some substances which

stabilize chloroform also stabilize certain dyes against decomposition by light.—*Howard B. Frost.*

METABOLISM (RESPIRATION)

1126. Allison, R. V. **The effect of aeration upon the development of barley in a heavy clay soil.** Soil Sci. **17**: 97–105. *Pl. 1, fig. 1–2.* 1924.—A method for percolating nutrient solutions and aerating soil cultures is described and figured. It was found that direct aeration of the cultures produced a very marked increase in the growth of barley. The change in reaction of the percolate was considerably greater than in the soil mass.—*C. G. Deuber.*

1127. Hee, A., et R. Bonnet. **Influence de la teneur en oxygène de l'eau sur la respiration des plantes submergées. [Influence of the oxygen content of the water upon the respiration of submerged plants.]** Compt. Rend. Acad. Sci. Paris **180**: 457–459. 1925.—A study is made of *Elodea canadensis, E. densa, Cabomba caroliniana,* and *Myriophyllum spicatum.* The variations in pH of the media were noted for 8 concentrations of oxygen from 3 to 24 cc. per liter. The data show that the intensity of respiration is not appreciably affected by variation of the oxygen content of the water.—*C. H. Farr.*

1128. [Kudriavtseva, A.] Кудрявцева, А. **Потребность корней растений в кислороде. [Oxygen requirements of plant roots.]** Научно-Агрономический Журнал. [Sci. Agron. Jour. **1**[1]: 48–67. 1924.—The author used for these experiments sterile cultures prepared according to the method of I. S. Shulov. The nutritive solution (Hellriegel's mixture) was saturated with oxygen. Prior to the experiment the amount of oxygen in the solution was determined. The changes in this amount, after the experiment had been concluded, enabled the author to ascertain how much oxygen had been consumed by the roots of the plants. The amount of oxygen was determined according to the method of Winkler. There were used in the investigation oats, wheat, peas, buckwheat, flax, sunflower, and mustard. As a result of a series of experiments the author comes to the conclusion that the roots of a plant require much oxygen and consume it immediately. Thus, for instance, the oxygen requirements of maize per gram of dry substance are expressed by 0.38 milligram; for peas, 1.37 milligram. The curve showing the consumption of oxygen by the roots reaches its maximum at the period of flowering. In the presence of a deficiency of oxygen, the roots of the plants take it from oxidized compounds which leads to a formation of NO_2 in the solution and entails chloroses of the plants.—*Dorochenko.*

1129. Nishi, S. **A revised titrimetric method of estimating CO_2 in small amount.** Jour. Biochem. Tokyo **4**: 473–480. 1925.—The author has previously described (Acta Sch. Med. Kyoto **7**[3]: 1925) a modification of Warburg's method of estimating CO_2 in which the $BaCO_3$ precipitate is filtered off before titration of the remaining $Ba(OH)_2$, thus eliminating the error due to dissociation of $BaCO_3$ and escape of CO_2 from solution during titration. In order to avoid the error due to imperfect filtration another method is now proposed. The CO_2 is absorbed in N/50 NaOH solution and titrated in presence of the $NaHCO_3$. As N/50 $NaHCO_3$ has a pH = 9.48, the use as indicator of thymolphthalein, which shows perceptible bluing at pH = 9.78, permits the titration of NaOH to completion without inclusion of any bicarbonate in the result. An apparatus devised for the purpose is figured and described.—*Joseph S. Caldwell.*

1130. Novy, F. G., H. R. Roehm, and M. H. Soule. **Microbic respiration. 1. The compensation manometer and other means for the study of microbic respiration.** Jour. Infect. Diseases **36**: 109–167. *Fig. 1–15.* 1925.—Detailed methods and equipment are described for accurate studies of respiration of microörganisms. The author describes the construction and operation of culture vessels and the compensating manometer, also methods for evacuating culture containers, for creating desired tensions of different gases, for the calibration of instruments, for sampling and analyzing the gases, and for correcting the obtained values in order to determine the absolute values of gases, the respiratory quotient CO_2:O_2 of aerobes, and the hydrogen quotient CO_2:H_2 of anaerobes.—*R. L. Starkey.*

1131. Novy, F. G., Jr. **Microbic respiration. IV. The so-called aerobic growth of anaerobes: Potato respiration.** Jour. Infect. Diseases **36**: 343–382. 1925.—Preceding the experimental work there is reported an extensive review of studies on the acceleration of

anaerobic growth by reducing action of (1) microbic association, (2) chemicals, (3) animal tissues, and (4) plant tissues. Numerous experiments were performed concerned with the respiration of potato. Respiration in a normal atmosphere was first aerobic and then anaerobic as oxygen became consumed. Optimum temperature for enzymes associated with such respiration appeared to be at or below 30°C. Respiration quotients were greatest at 31°C. and lowest at 39°C. and increased with progressive periods of incubation due to the development of anaerobic respiration as the oxygen became consumed. Autoclaved potato respired extremely slowly. Under aerobic conditions the potato produced from 7.01 to 9.62 cc. of CO_2 per gm. in 5 to 10 days, representing consumption of 6.9 and 9.2 cc. of O_2, respectively. Under these conditions the respiratory quotient was 1.006. Under anaerobic conditions created by a nitrogen atmosphere no hydrogen was formed. Alcohol was produced. When immersed in water or liquid media, potato absorbs dissolved O_2 which provides a medium more suitable for development of anaerobic bacteria. Cultures of anaerobes developed in the presence of pieces of potato, even though the potato was not in contact with the medium. No growth developed in similar tubes lacking potato. Anaerobes developed in jars which were freed of oxygen by respiration of pieces of potato. Growth of anaerobes was further accomplished by growth of aerobes in separate containers within the jars. Further, pneumococcus seeded in the same medium with anaerobes promoted growth of the anaerobe. It is concluded that plant tissue favors growth of anaerobes by complete removal of the oxygen that may be present, and its action is in nowise different from that of the aerobic organisms. These studies are believed to indicate that the beneficial action of potato and aerobes is in no way correlated with destruction of peroxides (supposedly produced by the anaerobes) by catalase (supposedly produced by aerobes or potato).—*R. L. Starkey.*

1132. Parker, F. W. **Carbon dioxide production of plant roots as a factor in the feeding power of plants.** Soil Sci. **17**: 229–247. *Fig. 1–2.* 1924.—Sorghum, cowpeas, buckwheat, cotton, and soybeans, were used in the experiments. Roots of buckwheat gave off very little CO_2; sorghum, soybeans and cotton more; and cowpeas the most. In feeding power, buckwheat ranked 1st, cotton 2nd and sorghum lowest. The feeding power of the plants for Ca, Mg, P, and K showed no relation to production of CO_2. Besides, there was a wide variation between the amounts of Ca, Mg, and P absorbed by different plants and the quantity of CO_2 excreted from the roots.—*W. E. Maneval.*

1133. Rockwell, G. E. **An improved method for anaerobic cultures.** Jour. Infect. Diseases **35**: 581–586. *Fig. 1–3.* 1924.—Details are presented for providing increased tension of CO_2 in common tube culture of anaerobes. The addition of CO_2 greatly increased growth of all the anaerobes studied (*Bacillus welchii*, *B. tetani*, *B. botulinus*, and organisms from purulent secretions). Carbon dioxide may be an essential to anaerobic growth.—*R. L. Starkey.*

1134. Ruhland. [Rev. of: Osterhout, W. J. V., and others. **Comparative studies on respiration.** Jour. Gen. Phys. [Vol.] 1–3. 1918–1920.] Zeitschr. Bot. **14**: 86–89. 1922.

1135. Ruhland. [Rev. of: Osterhout, W. J. V.] **A method of studying respiration.** Jour. Gen. Phys. **1**: 17–22. 1918.] Zeitschr. Bot. **14**: 89. 1922.

1136. Soule, M. H. **Microbic respiration. III. Respiration of trypanosoma lewisi and leishmania tropica.** Jour. Infect. Diseases **36**: 245–308. *Fig. 1–2.* 1925.—Accurate estimations were made for the 1st time of respiratory changes associated with growth of 2 species of pathogenic flagellates, *Trypanosoma Lewisi* and *Leishmania tropica*. Cultures showed progressive formation of CO_2 at the expense of oxygen. *L. tropica* grew about twice as rapidly as *T. Lewisi*, the former consuming practically all of the oxygen in a tube of about 100 cc. capacity in about 144 hours, the latter in about 288 hours. Growth and respiration of *L. tropica* were accelerated by partial pressures of oxygen under 60%. Inhibition was marked at this pressure and became more pronounced with higher concentrations. *T. Lewisi* was depressed at partial pressures of oxygen of about 45%. Pressure of CO_2 over 20% completely inhibited development of *T. Lewisi*. *L. tropica* was somewhat less sensitive to increased CO_2 tensions. High concentrations of either O_2 or CO_2 not only depressed growth but had destructive action of the organisms. The presence of CO_2 in the atmosphere is apparently not essential to growth of either organism. Growth was inhibited by anaerobic conditions created by either nitrogen

or hydrogen but the organisms were not destroyed, and developed when subsequently placed under aerobic conditions. Serum agar was as favorable if not a better cultural medium for the 2 organisms than whole-blood-agar. On blood-agar the respiratory quotient of *T. Lewisi* rose from 0.735 to 0.888 in 7–28 days of incubation. The average was 0.822. For *L. tropica* the quotient varied from 0.839 to 0.907, averaging 0.875. Apparently secondary changes in the medium, possibly enzymatic, were responsible for the ratio increases at later stages. The quotient for *T. Lewisi* and *L. tropica* on dextrose-blood-agar averaged 0.938 and 0.951, respectively. These were close to the theoretical value for combustion of a carbohydrate-protein mixture where 3 parts of glucose to 1 of protein were decomposed. More base was produced on the blood-agar medium than on the dextrose-blood-agar, showing the sparing action of carbohydrate on protein decomposition. The use of rubber stoppers may greatly affect the accuracy of experiments due to absorption of CO_2.—*R. L. Starkey.*

ORGANISM AS A WHOLE

1137. Arnold, L., and E. Weiss. **A study of bacteriophage with antibacteriophagic serum.** Jour. Infect. Diseases **35**: 505–517. 1925.—Bacteria grown on antilytic serum were as susceptible to bacteriophage activity as those grown on normal serum or broth. Growth of bacteria in antilytic serum had not appeared to remove or change the antilytic material in the serum. Between 37 and 50°, antilysins were not damaged; at 60°, partly destroyed; and between 70 and 100°C. completely destroyed. With time, the action of antilysin was lessened in mixtures with bacteriophage and more at higher temperatures. Antilysin action was less when time elapsed between adding portions to the bacteriophage than when the whole amount was added at once. Time was consumed for the neutralization of bacteriophage by antilysin. These findings were interpreted as indicating that effects of reaction and neutralization were similar to those for action of toxin-antitoxin. No evidence was observed of lipolytic activity of bacteriophage.—*R. L. Starkey.*

1138. Bailey, Sadie F. **"Hormone" mediums. Simple method of preparation and value of hormone blood agar for preserving pneumococci and streptococci.** Jour. Infect. Diseases **36**: 340–342. 1925.—Methods are described for the preparation of a modified beef infusion agar; 62 cultures of pneumococcus and 32 cultures of streptococcus were kept alive for 12 months without transplanatation on this medium.—*R. L. Starkey.*

1139. Boschma, H. **The nature of the association between anthozoa and zooxanthellae.** Proc. Nation. Acad. Sci. [U. S. A.] **11**: 65–67. 1925.—The author concludes that the zooxanthellae (yellow algae) which occur abundantly in the entoderm of reef corals probably derive some benefit from the symbiotic relation, but that they are digested in large numbers by the polyps and seem to supply an important portion of their food. *Astrangia* (studied at Woods Hole) usually lacks zooxanthellae, but when present in the polyps they are generally abundant and in process of digestion in the zone where food artificially supplied is ingested, while after abundant feeding with meat they cease to be taken in. Studies on 4 genera of corals at Bermuda indicated that these all digest large numbers of zooxanthellae.—*Howard B. Frost.*

1140. Bump, W. S. **Observations on growth of Coccidioides immitis.** Jour. Infect. Diseases **36**: 561–565. 1925.—The organism develops well on common laboratory media and requires no carbohydrates. It develops over a range of pH 2.0–12.1. Ammonia is formed by its growth at the expense of the organic nitrogen compounds contained in the media.—*R. L. Starkey.*

1141. Burke, Victor, Aileen Sprague, and LaVerne Barnes. **Dormancy in bacteria.** Jour. Infect. Diseases **36**: 555–560. 1925.—Vegetative cells of bacteria may be dormant beyond the lag period. While 85% of cells of *Bacillus coli* developed in 48 hours, some remained dormant for 16 days. While the majority of spores of *B. subtilis* and *B. megatherium* germinated within 4 to 5 days, some spores of the former remained dormant for 39 days and of the latter for 90 days. It appears that dormancy and lag are different phenomena dependent upon different factors. Their relationship to infection appears to be of considerable importance.—*R. L. Starkey.*

1142. Colin, H., et A. Grandsire. **Structure et chimisme dans la betterave. [Structure and chemical composition of the beet.]** Compt. Rend. Acad. Sci. Paris **180**: 599–601. 1925.—

A study is made of the giant red variety with only 3 "annual" rings. After a brief discussion of the structure, an analysis is given of the dry matter, ash, sugar, sucrase, oxydases, and of the acidity of the parenchyma and vascular tissue.—*C. H. Farr.*

1143. Effront, Jean. **Influence de la constance du milieu sur le développement et le travail chimique des micro-organismes. [The effect of a constant medium on the chemical work accomplished by microörganisms.]** Compt. Rend. Soc. Biol. **91**: 1175–1178. 1924.—Ordinarily when yeast is placed in a nutrient solution growth starts slowly. This is followed by an intense activity which finally stops entirely. This has been attributed to the formation of toxic products. Four sets of experiments are here reported in which parts of the environment were kept constant. In the 1st set (control) all the nutrients were introduced at the start. In the 2nd set all were introduced at the beginning except the sugar which was gradually added whenever it was observed that half of the original amount had been used up. The results vary only slightly from the control.—In the 3rd set the mineral salts were added in the same manner and likewise little variation from the control was observed.—When, however, only a small amount of nitrogen was added at a time, the dry weight of yeast produced increased over 300%, no alcohol at all was produced in the solution, and the nitrogen content increased about 16%.—*Oran Raber.*

1144. Ehrenberg, Paul. **Neue Feststellungen über die sog. Virulenzsteigerung der Knöllchenbakterien ünserer Leguminosen. [Increasing the virulence of the tubercle bacteria of legumes.]** Zeitschr. Pflänzenernähr. u. Düngung **5**: 104–106. 1925.—Positive results are reported in some cases.—*F. M. Schertz.*

1145. Gratia, André, et Sara Dath. **Propriétés bactériolytiques de certaines Moisissures. [Bacteriolytic properties of certain molds.]** Compt. Rend. Soc. Biol. **91**: 1442–1443. 1924.—A species of *Streptothrix* is reported and described which has the same action as a bacteriophage in clearing up an emulsion of dead Staphylococci. It is an example of the "antagonism between proteolytic and peptolytic microörganisms," described by Schiller. The author suggests that these organisms may play an important part in the destruction of bacteria in the natural cycle of living matter.—*Oran Raber.*

1146. Hadley, Philip. **Proliferative reaction to stimuli by the lytic principle (Bacteriophage) and its significance.** Jour. Infect. Diseases **37**: 35–48. *Pl. 1.* 1925.—The phenomena of renewed growth in partially lysed colonies and the development of resistant strains are discussed. Cells are grouped into 3 classes on the basis of their resistance to bacteriophage action: (1) Cultures of the organisms are rapidly and completely lysed; (2) partial adaptation of the colony to the lytic agent, where many cells may be destroyed but enough cells resist lysis to continue the growth of the culture; (3) complete adaptation, where the cells are not injured but contain the lytic agent. The possibility of associations between the bacteria and bacteriophage in antibiosis and metabiosis with variations between these 2 extremes, is discussed.—*R. L. Starkey.*

1147. Hagan, William A. **The green coloration by certain streptococci on blood agar.** Jour. Infect. Diseases **37**: 1–12. *Pl. 1.* 1925.—Peroxide was formed by the streptococcus used (alpha or viridans type) if (1) sufficient free oxygen was present, and if (2) the organisms were undergoing normal rapid growth. No peroxide was formed from dead organisms, from cells suspended in saline solution or other media unfavorable for growth, or at temperatures or reactions unfavorable for rapid growth. Peroxide was formed most rapidly during periods of most rapid growth. Peroxide alone failed to discolor corpuscles in blood agar. Acids alone produced hemolysis of the blood cells and concentrated solutions produced greenish gray coloration. When acids were used with peroxide a deep green coloration was produced. The experimental evidence "leads to the conclusion that the green pigmentation produced by certain streptococci in blood-agar plate cultures is due to the action of peroxide on the blood corpuscles in the presence of acid." Hemolysis by such cultures is apparently most extensive when peroxide formation is low and the acid formed exerts the hemolysis.—*R. L. Starkey.*

1148. Hotchkiss, Margaret. **Factors influencing the bacterial flora of an imhoff tank.** American Jour. Public Health **15**[8]: 702–704. 1925.—Samples were collected twice a week from liquid 7 feet below the level of the tank, from December, 1923, to October, 1924. Plate counts were made and qualitative tests in liquid media to determine the smallest amount of inoculum

necessary to produce (1) a digestion of albumen, (2) H_2S from protein, (3) nitrogen gas from nitrate, (4) nitrite from ammonium salts, and (5) nitrate salts from nitrite salts.—The author presents charts showing the results by plotting the moving averages. She suggests a number of points as follows: None of the curves suggests a relation with seasonal variations in temperature, the bacteria increase in an operating tank and decrease in a resting one, the increase in albumen digesters and the bacteria growing on agar plates in June was probably due to the fact that during this month the temperature rose above the average for the year. There was no increase in the other groups of organisms. There are varied phases in the digestion of material in which a succession of bacteria take a predominant part. The manner of operating the tank influences the general flora and tends to obscure any seasonal variations.—*C. T. Butterfield* (*Public Health Engineering Absts.*)

1149. Howard, Norman J., and Rudolph E. Thompson. **Isolation of the colon group in water.** Water Works Issue, Engineering and Contracting **64**[3]: 597–606. 1925.—The following conclusions are reached as a result of comparative tests with Lake Ontario water: (1) Eosin methylene blue agar is one of the best solid media at present in use. It is essential, however, to subculture all colonies isolated if reliable results are desired. (2) Lactose broth is the most suitable medium for the *B. coli* presumptive test. (3) Brilliant green lactose broth is highly inhibitory and useless except to restrict the growth of the colon group. (4) There is little difference between sodium taurocholeate (bile salt) broth and brilliant green lactose bile (ox gall) for the presumptive test. Both are slightly inhibitory. (5) Brilliant green bile produced fewer presumptive positives but approximately 96.0% of all positives confirmed out. (6) Of the total number of tubes examined, lactose broth produced a higher percentage of confirmatory tests. (7) The use of brilliant green bile as a confirmatory medium is a simple, rapid and reliable method of confirming the colon group, and may be safely substituted for the present methods employed.—*Emery J. Theriault.* (*Public Health Engineering Absts.*)

1150. Jordan, E. O., and G. M. Dack. **The effect of Cl. sporogenes on Cl. botulinum.** Jour. Infect. Diseases **35**: 576–580. 1925.—The simultaneous development of *Clostridium obtulinum* and *Cl. sporogenes* in media where the former is present in equal or inferior numbers interferes with formation of botulinus toxin.—*R. L. Starkey.*

1151. Kappen, H. **Untersuchungen zur Bodenaziditätsfrage durch Vegetationsversuche. [Vegetation experiments on the soil acidity question.]** Zeitschr. Pflanzenernähr. u. Düngung **4**: 202–214. 1925.—The relation of plants to hydrolytical soil acidity and the relation of plants to acid exchange as well as the influence of fertilizers upon acid exchange are discussed.—*F. M. Schertz.*

1152. Leffmann, Henry. **Hydrogen-ion concentration in relation to animal and plant growth.** Jour. Franklin Inst. **197**: 741–756. *5 fig.* 1924.—This is an abstract of a popular lecture, in the main recounting briefly the history of studies on acidity and describing the special studies of Edgar J. Wherry upon the relation of soil acidity to the development of plants.—*Ernest S. Reynolds.*

1153. Lutz, L. **Sur la culture des Champignons Hyménomycètes en milieu artificiel. [The culture of Hymenomycetes on artificial media.]** Compt. Rend. Acad. Sci. Paris **180**: 532–534. 1925.—Most previous work has been with media containing plant decoctions, etc. This paper reports successful growth of these fungi on mixtures of pure chemicals (sugar, salts) with gelatin. In every case carpophores developed, especially with *Schizophyllum commune.*—*C. H. Farr.*

1154. [Maksimov, N. A., E. V. Lebedintseva, and T. A. Krasnosel'skaĭa-Maksimova.] Максимов, Н. А., Е. В. Лебединцева, и Т. А. Красносельская-Максимова. **О влиянии условий освещения на развитие и деятельность корневой системы. [Influence of the conditions of illumination on development and activity of the root-system.]** Известия Главного Ботаническоко Сада Р. С. Ф. С. Р. [Bull Principal Bot. Gard. U. S. S. R.] **23**[1]: 1–10. 1924.—The authors have investigated the root-systems in shade and light plants and have come to the conclusion that specimens grown in the shade possess a less vigorously developed root-system than those cultivated in direct sunlight. The stimulating action of light manifests itself after a comparatively short time. The root-systems of shade plants which were shifted to light conditions attain 2–3 times their former size in a space of 2–3 weeks.

The strongly stimulating action of light becomes especially prominent in the development of the conductive elements. The water supply furnished by the root-system in light plants is much more vigorous than in shade plants.—(See also Bot. Absts. 13, Entry 3910.)—*Dorochenko.*

1155. Marshall, Max S. **Observations on d'Herelle's bacteriophage.** Jour. Infect. Diseases **37**: 126–160. *2 pl., 2 fig.* 1925.—The studies here reported are concerned mainly with a bacteriophage particularly active against *Eberthella dysenteriae* (Shiga). A method is described which proved satisfactory for estimating the concentration of bacteriophage. In normal culture, *Eberthella dysenteriae* multiplied at the rate of once every 31.3 minutes. In the presence of bacteriophage the organism appeared to multiply according to its normal logarithmic rate for a period, during which time the bacteriophage did not change appreciably. This period was followed by one of rapid lysis of the bacterial culture and rapid proliferation of the bacteriophage. There was definite absorption of bacteriophage by homologous living and dead bacteria as well as by some heterologous bacteria (those not sensitive to action of this bacteriophage) but not by others. Absorption also occurred on filters and parchment membranes. Diffusion of the bacteriophage proceeded slowly through agar and parchment and heavy collodion membranes. The resistant strains developing from cultures lysed by bacteriophage are believed to be normal cells which are never completely lysed. They develop slowly and show differences in growth characteristics. Such strains may be considered to consist of some normal cells, and a large proportion of old cells with acquired resistance having adsorbed and absorbed bacteriophage.—*R. L. Starkey.*

1156. Muttelet, C.-F. **Etude du développement végétal du pois, en vue de sa conservation alimentaire.** [**Study of the vegetative development of peas, in relation to their food value.**] Compt. Rend. Acad. Sci. Paris **180**: 317–319. 1925.—Analysis is made of the cellulose material, hydrolysable substance, and nitrogen in peas, variety "Merveille d'Amerique," in different stages of development, namely, small green peas, medium green peas, full-grown green peas; green peas bought on the market, and ripe-dry peas. It is found that ripe-dry peas have the least cellulose, the most of insoluble hydrolyzable substance, the least of soluble hydrolyzable substance; the most of insoluble and the least of soluble nitrogenous material.—*C. H. Farr.*

1157. Nemec, Antonin. **Sur la concentration en ions hydrogène dans le tissu des graines.** [**The concentration of hydrogen ions in the tissue of seed.**] Compt. Rend. Acad. Sci. Paris **180**: 1776–1778. 1925.—Thirty-eight species were tested. The hydrogen ion concentration varies from 4.2 for *Panicum* and *Plantago* to 6.45 for *Zea mays*. It is suggested that the H-ion concentration of the seed may represent the correct value of the best medium for the development of the plants arising from these seed.—*C. H. Farr.*

1158. Raabe, Henryk. **Sur l'influence de certains facteurs dans de développement du flagelle Prowazekia (Bodo) edax.** [**The influence of certain factors on the development of the flagellate Prowazekia Edax.**] Bull. Soc. Chim. Biol. **7**: 842–859. 1925.—Continuing earlier work upon the effect of H-ion concentration on the organism (see Bot. Absts. 14, Entry 9521), the author here studies the relation between surface area and volume of culture to rate of multiplication and duration of life of the organism. In cultures of equal surface area and unequal depth, seeded at outset with equal numbers of individuals, the deeper cultures produced the largest number of individuals, but multiplication therein ceased and the cultures died out while growth was still continuing in the shallow cultures. The latter also had the most rapid rate of multiplication in the 1st 7–10 days. The effect of concentration of the medium was studied in a series of cultures on bouillon ranging from N/200 to 3/N normal concentration. Multiplication was most rapid and the largest number of individuals was developed in cultures having 40–75% normal concentration of bouillon, and was least rapid in the more concentrated cultures. Bacteria multiplied so rapidly on the concentrated cultures that their endproducts hastened the dying out of the organism. Lowering the temperature at which the cultures were kept decreased the rate of multiplication but increased the time elapsing before the cultures died out. Whatever the initial pH of the culture, it approached 9.1 as growth ceased and death of the organism occurred.—*Joseph S. Caldwell.*

1159. Starin, W. A., and G. M. Dack. **Pathogenicity of Clostridium botulinum.** Jour. Infect. Diseases **36**: 383–412. 1925.—Evidence is presented which suggests that *Clostridium botulinum* proliferates in the animal body subsequent to injection and produces toxin there,

provided large numbers of cells are injected. These viable spores may remain latent in the animal for a long time. Neither quinine hydrochloride nor calcium chloride when injected into animals appeared to have any effect on the pathogenicity of spores of *C. botulinum*, contrary to the effects of such compounds on *C. tetani*. The organism develops and produces toxin when planted in the animal body within collodion sacs. In only exceptional cases was there appearance of antibody formation in the blood of animals receiving implantations of these sacs. Following injection, spores of the organism might be found in many different tissues showing no tendency to localize in any special region.—*R. L. Starkey.*

1160. Werkman, C. H., F. M. Baldwin, and V. E. Nelson. **Immunologic significance of vitamins. V. Resistance of the avitaminic albino rat to diphtheria toxin; production of antitoxin and blood pressure effects.** Jour. Infect. Diseases **35**: 549–556. 1924.—Several factors appear to be of importance in accounting for the lowered resistance of animals fed on diets deficient in vitamins. Rats suffering from lack of vitamins A or B succumb to the effects of smaller injections of diphtheria toxin than do normal animals, but the ability to produce antitoxin is not apparently disturbed.—*R. L. Starkey.*

GROWTH, DEVELOPMENT, REPRODUCTION

1161. Clark, Norman Ashwell, and Emery M. Roller. **"Auximones" and the growth of the green plant.** Soil Sci. **17**: 193–198. *Fig. 1–5.* 1924.—*Lemna major* was grown in varying concentrations of Ca $(H_2PO_4)_2$, KNO_3, $MgSO_4$ and $FePO_4$, and also in soil and water. The rate of reproduction in the mineral solutions was only slightly less than in the soil-water solution and even after 4 months there were no signs of decrease in size of the plants. The authors conclude that "auximones" are unessential for growth and reproduction of green plants.—*W. E. Maneval.*

1162. Minott, C. W., and I. T. Guild. **Some results of the defoliation of trees.** Jour. Econ. Entomol. **18**: 345–348. *Pl. 1.* 1925.—"Aside from killing of trees by defoliation there is a loss in growth of those that survive. This has been measured accurately for many New England species defoliated by the gipsy moth, *Porthetria dispar*. Observations extending over 10 years are summarized and indicate that loss in growth is roughtly proportional to the degree of defoliation. In the period nearly one-half of the oaks died and the survivors lost on the average more than one-third of their foliage and growth annually." A plate shows the effect of defoliation on annual ring formation.—*A. B. Massey.*

1163. Pearl, Raymond, and Lowell J. Reed. **Skew-growth curves.** Proc. Nation. Acad. Sci. [U. S. A.] **11**: 16–22. *4 fig.* 1925.—The authors have shown (Metron 3: 6–19. 1923.) that an equation applicable to skew single-cycle growth curves is given by cutting off at the cubic term the exponent of e in the general growth curve $y = \frac{k}{1 + me^{a_1x + a_2x^2 + a_3x^3 + \ldots + a_nx^n}}$. To illustrate the adequacy of this procedure, 4 actual skew growth curves are here satisfactorily fitted; the data employed are on weight of albino rats (Donaldson), weight of *Cucurbita pepo* (Robertson), and length of regenerating tadpole tail (Durbin).—*Howard B. Frost.*

1164. Peskett, G. L. **Allelocatalysis and the growth of yeast.** (Abstract.) Jour. Physiol. **59**: XXXIII. 1924.—Only 3 out of 128 hanging drop cultures, having 1–3 yeast cells, gave evidence of allelocatalysis such as J. B. Robertson demonstrated in *Euchelys*. Both synthetic and bios-containing media were used.—*Ernest S. Reynolds.*

1165. Proebsting, E. L. **The relation of stored food to cambial activity in the apple.** Hilgardia **1**: 81–106. *Fig. 107.* 1925.—When young apple trees were defoliated at different dates in the spring, it was found by measurement of twigs that all radial increase of wood stopped within 2 weeks after defoliation. The wood cells formed after defoliation were thin-walled and resembled spring wood. Chemical analyses for reducing sugar, total sugar, starch, hemicellulose, and total nitrogen in the wood and bark, showed that this cessation of growth is not associated with a lack of stored food. The suggestions made as to cause are the following: Enzyme inactivation, failure of the leaves to supply or distribute certain compounds directly, and lack of balance of the carbohydrate-nitrogen ratio. There is a full discussion of the views advanced by other workers, and a bibliography is given.—*Margaret Buvens.*

1166. Werkman, C. H. **Continuous reproduction of microorganisms in synthetic media.** Science 62: 115–116. 1925.—Growth and reproduction of microorganisms, particularly of *Saccharomyces cerevisiae*, in a wholly synthetic medium has been considered impossible. Previous exceptional cases of successful growth have been attributed to unanalyzable traces of "bios" in the case of yeast or to the use of large amounts of the original inoculation. By the use of a method of single cell cultivation in a medium consisting of the medium E base of Fulmer and Nelson and succinic acid, methose, glycerol or dextrose, continuous growth has been obtained with such forms as *Saccharomyces cerevisiae*, *S. ellipsoideus*, *Torula rosea* and *Oospora lactis*. Bacterial vitamin requirements have been studied in a similar manner and the number of forms that appear to live without vitamin or "bios" or that can synthesize it, included *Pseudomonas fluorescens*, *Aerobacter aerogenes*, *Bacillus mycoides*, *B. subtilis*, *Azotobacter chroococcum* and several others.—*C. J. Lyon.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

1167. Bose, J. C., and G. P. Das. **Physiological and anatomical investigations on Mimosa pudica.** Proc. Royal Soc. London B 98: 290–312. *Pl. 1–8.* 1925.—Excitation in *Mimosa* is shown to be produced and transmitted to a distance by the characteristic protoplasmic stimulation at cathode-make and anode-break. The nervous character of the impulse is further proved by its arrest by an electro-tonic block. Facilitation is produced by previous stimulation; stimulus thus canalises its own conducting path. By means of the electric probe, the conducting or "nervous" tissue has been localised in the phloem of the vascular bundles. The conducting tissue is characterised by elongated tubular cells in longitudinal series. The transverse septum separating tubular cells acts like a synapsoidal membrane on account of which there is a preferential direction of conduction as in the nerve of the animal. The petiole contains 4 main conducting phloem-strands, which meet and form an almost continuous ring at the central pulvinar end. These 4 conducting strands terminate separately in the 4 sub-petioles carrying the sensitive leaflets. The nervous connection between the center and periphery has been traced both anatomically and physiologically. Peripheral stimulation of each of the 4 sub-petioles gives rise to characteristic responsive movements of the leaf, up or down, a left-handed or a right-handed torsion.—Simultaneous determination of the extent of transport of chemical stimulant applied to the tip of the leaf and of the distance of propagation of excitation, showed that while the stimulant had remained practically localised at the point of application, the propagated excitation had travelled through a considerable distance. The transmission of excitation is therefore in no way connected with the movement of sap.—The pulvini of leguminous plants all exhibit slow nyctitropic movements; there are only a few, like the main pulvinus of *Mimosa*, which are highly excitable, exhibiting a rapid and almost instantaneous movement under even the feeblest stimulus. At the opposite extreme of sensitivity are the unexcitable pulvini of *Phaseolus* or of *Erythrina indica*, which exhibit no movement under moderate stimulus. Intermediate between the 2 extremes is the semi-excitable pulvinus of *Neptunia*. The cause of the difference has been discovered in the protoplasmic modification in the active cell. Differential staining by haematoxylin and safranin produces the most remarkable result of differentiating the active cells, which becomes stained deeply red. It is shown (1) that there is a protoplasmic modification in the active cells, such modifications being detected by differential staining; (2) that this staining differentiates the active and inactive pulvini, the latter not being stained at all; (3) that the line of demarcation between the active and the inactive cells in a petiole-pulvinus preparation becomes sharply defined by the differential action of staining reagents; and (4) that the relative extent and density of staining affords a measure of the excitability of the motor organ. The high sensitivity of the pulvinus of *Mimosa* is shown to be due to the presence of a catalyst in the plasmatic contents of the active cells. The energy of rapid movement is ultimately derived from oxidation; the active substance is found to be highly oxidizable and reactive, being an unsaturated compound with double or triple bond combinations.—*N. C. Nag.*

GERMINATION, RENEWAL OF ACTIVITY

1168. [Bychikhina, E. A.] Бычихина, Е. А. **О послеуборочной всхожести зерна колосовых хлебов. [The germinative capacity of the cereal grains after harvest.]** Одесская

Областная Сельск.-Хоз. Опытная Станция. [Odessa Agric. Exp. Sta.] *1–8 p.* 1924.—The different varieties investigated by the author proved very different in regard to physiological maturity, showing fluctuations in the germinative capacity of the newly harvested grain; however, in about 5–6 weeks after harvest, all varieties had reached a normal percentage of germinative capacity, but rate and character of ripening were very different in the investigated varieties. The energy of the germinative capacity in the newly harvested (at 3 days) grain was low and remained almost without change during the whole period of investigation (7–9 weeks), differing perceptibly from the energy of the germinative capacity of ripe grain.—*Dorochenko.*

1169. [Bychikhina, E. A.] Бычихина, Е. А. **Последовательные этапы развития прорастающих семян пшеницы и ячменя.** [Successive stages of development of the germinating seed of wheat and barley.] Одесская Областная С.-Хоз. Опытная Станция. Вып. [Odessa Agric. Exp. Sta. Bull. 4.] *1–15.* 1924.—The author has undertaken investigations of the development of the process of germination in wheat and barley. He establishes experimentally the fact that winter and spring forms of wheat and barley, in the first stages of germination, show sharp varietal differences in their response to optimum moisture and to a temperature of 20°C. These differences are especially prominent in the stage of the swelling of the grain.—*Dorochenko.*

1170. Harlan, H. V. **The germination of barley under late spring malting conditions in India.** Science **61**: 566–567. 1925.—The percentage of germination in June is low and the plumule is less than ⅓ the length of the kernel. However, the starch conversion is good, which must mean that the higher temperatures of June retard the enzyme secretion less than growth.—*C. J. Lyon.*

1171. [Kuleshov, N. N.] Кулешов, Н. Н. **Опыты по изучению послеуборочного дозревания озимых хлебов.** [The ripening of winter cereals after harvest.] Харьковская Семенная Контрольная Станция. [Charkov Seed Testing Sta.] *1–40 p.* 1924.—By investigating the ripening of rye and wheat grains after harvest, the author has demonstrated that under the climatical conditions noted, rye, when investigated immeditely after harvest, shows a higher germination capacity than wheat, while in wheat the increase of this germination capacity proceeds more vigorously. A high germinative capacity immediately after harvest is indubitably a hereditary individual character, belonging to the strain, not to the variety. The percentage of water content in the grain at harvest is in no relation with its germination. The destroyed integrity of the seed-coat leads to vigorous germination and augments the percentage of germination; its involves, however, an increase in the number of decayed grains.—The preservation of the newly harvested grain in an atmosphere of hydrogen entails no changes in the process of after-harvest ripening, if compared with the same process in grain kept in the air.—*Dorochenko.*

1172. Lesage, Pierre. **Contribution à l'étude du stade graine, de ses causes et des moyens à employer pour les modifier.** [The seed stage, and possibilities of modifying it.] Bull. Soc. Sci. et Med. Ouest **1921**: (1–6). 1921.—The author discusses the resting period of the seed as a discontinuity in the life history of angiosperms. Attempts were made to modify this resting period by injecting solutions into the ovule case.—*A. F. Camp.*

1173. Maxwell, Herbert. **The germinating power of seeds.** Gard. Chron. [London] Ser. III. **76**: 269. 1924.—These notes concern (1) a high germination of *Dierama spectabile* after 3 years; and (2) the vegetation of an old lake bed 46 years after drainage, in which an unusual association of *Pyrola minor* was found, the intimation being made that the seed might have lain beneath the waters for a long period before drainage.—*P. L. Ricker.*

TEMPERATURE RELATIONS

1174. Anonymous. **Temperature variations in plants.** Sci. Amer. **131**: 321. 1924.

1175. Crozier, W. J., and H. Federighi. **On the measurement of critical thermal increment for biological processes.** Proc. Nation. Acad. Sci. [U. S. A.] **11**: 80–82. *1 fig.* 1925.—In determining the relation of biological velocities to temperature, one source of error is the variation of individual organisms. As a test of individual variability in material of "exceptional genetic uniformity," the frequency of heart beat was determined for silkworms from

eggs of 1 female. The data show a "linear relation of *log frequency* to *reciprocal of absolute temperature;*" the equation is $\frac{Frequency_2}{Frequency_1} = e^{\frac{\mu}{2}\left(\frac{1}{T} - \frac{1}{T_2}\right)}$. The means of series of determinations for the different individuals had about the same range of variation. "The latitude of variation in frequency is at any temperature a fixed fraction of the corresponding mean frequency." When variation is sufficiently reduced, biological velocities "are found to obey with exactitude the law of temperature influence upon irreversible chemical processes." Detailed experimental analysis of suitable representative cases will permit interpretation of more variable material.—*Howard B. Frost.*

1176. Dickson, E. C., Georgina S. Burke, Dorothy Beck, and Jean Johnson. **Studies on the thermal death time of spores of Clostridium bolutinum. IV. The resistance of spores to heat and the dormancy or delayed germination of spores which have been subjected to heat.** Jour. Infect. Diseases 36: 472–483. *Fig. 1–2.* 1925.—At any temperature no sharp line of demarkation was found in the time required to produce, on one side, sterility in a series of cultures and, on the other, growth in all tubes. There were skips in series showing presence of living spores in a few tubes among many sterile tubes and at other times a few sterile tubes among many active cultures. In all instances where sterility was not obtained, the spores were dormant for long periods before germination, after heating for the longer periods of time. Considerable variation was noted in heat resistance of spores of any culture of a single strain and also marked variation in resistance of spores of different strains. Heat resistance of spores in broth layered with oil was greater than in broth lacking the oil covering.—*R. L. Starkey.*

1177. [Govorov, L. I.] Говоров, Л. И. **Природа различий озимых и яровых форм хлебных злаков в связи с вопросом зимостойкости озимей. [The diverse characters of winter and spring forms of cereals in connection with the problem of hardiness in winter crops.]** Труды по Прикл. Бот. и Селекции [Bull. Appl. Bot. & Plantbreed.] **13**[1]: 525–559. 1922–1923.—According to the author's investigations the most characteristic feature by which winter wheats are distinguished from spring wheats, is the different degree of plasticity in the contents of glucose at different temperatures. The spring forms, when removed to a higher temperature, show a distinct decrease in glucose content, while the winter forms respond weakly or not at all to rise of temperature. When the plants are changed from high to low temperatures the hardy winter varieties show a quicker accumulation of glucose than the spring forms. Along with increase of glucose at low temperatures, there is observed in the winter forms a greater relative fall in respiration. In addition, hardy winter forms differ from the tender ones and from spring forms by a higher osmotic pressure of the cell sap. With regard to variation in glucose content, as well as to respiration at low temperatures, the differences between spring and winter forms are most prominent in the tillering stage.—*Dorochenko.*

1178. Molliard, Marin. **Comment agissent les températures élevées, compatibles avec la vie, sur le développement des cellules. [The influence of supra-optimal temperatures upon the development of cells.]** Compt. Rend. Acad. Sci. Paris **180**: 1460–1462. 1925.—The maximum activity of *Sterigmatocystis nigra* is at 36°C. It diminishes with a rise to 44°. There is also a change in the form of the cells. They do not stain in iodine at 36°, but they stain blue in this reagent at 40–44°. They also become sterile at the higher temperatures. The ash content decreases with a rise in temperature to 36°. At 45° death occurs, but there is a higher ash content than at 36°. This is taken to indicate that in death the cytoplasmic membrane becomes freely permeable.—*C. H. Farr.*

RADIANT ENERGY RELATIONS

1179. Anonymous. **Are there biologic rays?** [Abstract: Weber, F. Die Umschau. **28**: 317. 1924.] Sci. Amer. **131**: 416. 1924.

1180. Ancel, P., and P. Vintemberger. **De l'action des rayons X sur la segmentation et la gastrulation chez Rana fusca. [Action of X-rays on segmentation and gastrulation in R. fusca.]** Compt. Rend. Soc. Biol. **91**: 1267–1270. 1924.

1181. Ancel, P., and P. Vintemberger. **La sensibilité d'une cellule aux rayons X est-elle plus grande au cours de la mitose que pendant le repos? [Is a cell more sensitive to X-rays**

during mitosis than in the resting period?] Compt. Rend. Soc. Biol. **91**: 1271–1273. 1924.—Experiments with chicken eggs lead to the conclusion that the blastoderm of the egg is not more sensitive to X-rays during mitosis than when in the resting period.—*Oran Raber.*

1182. Coblentz, W. W., and H. R. Fulton. **A radiometric investigation of the germicidal action of ultra-violet radiation.** Sci. Papers Dept. Commerce, Bur. Standards **495**: 641–680. *Fig. 1–11.* Washington, D. C., 1924.—Using *Bacillus coli* as a test organism it is shown that germicidal action is produced by ultra-violet radiation throughout the spectral range from the very short wave-lengths (Schumann rays) to and including 365$\mu\mu$, whereas previous investigations have been interpreted as indicating that the long wave-length limit of germicidal action is in the region of 297$\mu\mu$. The shortest rays have the most violent lethal action, which decreases in intensity with increase in wave-length. The lethal action of radiations of wave-lengths longer than 305$\mu\mu$ was found to be very slow in comparison with those of less than 280$\mu\mu$. The energy value of the most active germicidal radiations from the quartz-mercury arc (170–280$\mu\mu$) required to kill a single bacterium is very small, being of the order of 19×10^{-12} watt.—*H. R. Fulton.*

1183. Davy de Virville, Ad. **Action de la lumière sur les mousses.** [**The effect of light on mosses.**] Compt. Rend. Acad. Sci. Paris **180**: 1959–1961. 1925.—The effect of light on the form of species of *Mnium, Hypnum, Thyidium,* and *Rhacomitrium* is described. The effect of the medium in general is also noted. The author states that the results are particularly interesting as they show that one can hope for the development of a truly new science of experimental cytology.—*C. H. Farr.*

1184. [Ivanov, L.] Иванов, Л. **О приближенном вычис лении сумм прямой солнечной радиации.** [**Approximative calculation of the sum of direct radiation of the sun.**] Метеорологический Вестник. [Meteorological Bull.] **4**: 1925.—The author suggests a direct and available method of determining the sum of direct solar radiation for a certain period. This method is founded on a combination of actinometric observations on cloudless days, with the readings of the heliograph by way of introducing some corrections. The corrections concern in the 1st place more accurate measurements of the hours of sunshine from the readings of the heliograph, particularly when the action of the sun is short but strong. The 2nd correction gives a more exact conversion of the readings of the heliograph into calories. It is founded on making a distinction in the heliogram between 3 kinds of intensity of radiation, according to the length of the record. The data obtained in such a way present, according to the author's calculations, a deviation from the respective data obtained by the actinograph of Krova-Savinov, amounting for decades and pentades to an average of 5.7%, at a maximum of 15%; and for a month to an average of 4.5% at a maximum of 9.7%. The author considers this method capable of still further simplification by replacing the actinometric measurements with data taken from Angot's table and determining the coefficient of atmospheric transparency according to the absolute humidity.—*Dorochenko.*

1185. Oltmanns. [Rev. of: Mast, S. O. **The relation between spectral color and stimulation in the lower organisms.** Jour. Exp. Zool. **22**: 471–528. 1917. **Effects of chemicals on reversion in orientation to light in the colonial form, Spondylomorum quaternarium.** Ibid. **26**: 503–520. 1918. **Reversion in the sense of orientation to light in the colonial forms, Volvox globator and Pandorina morum.** Ibid. **27**: 367–390. 1919.] Zeitschr. Bot. **14**: 183–185. 1922.

1186. Rousseau, Emile. **Résonance photochimique ou fixation de l'énergie ultra-violette par certaines substances.** [**Photochemical resonance or the fixation of ultra-violet energy by certain substances.**] Compt. Rend. Soc. Biol. **91**: 1009–1011. 1924.—To a 40% solution of formalin was added 2 parts in 1,000 of $MnCl_2$. The reducing action is increased. If the solution is photocatalysed the reducing action is still more increased.—*Oran Raber.*

1187. Rousseau, Emile. **Fixation de l'énergie ultra-violette par le manganèse.** [**The fixation of ultra-violet energy by manganese.**] Compt. Rend. Soc. Biol. **91**: 1190–1192. 1924. —If a 10% solution of $MnCl_2$ is submitted to ultra-violet rays it acquires a photocatalytic power which it retains for several months.—If the ultra-violet source is a quartz tube, there is an optimum exposure time beyond which the catalytic power decreases, but if the source is the sun or an electric bulb the action becomes stabilised and reaches a maximum beyond

which further exposure has no effect.—The quality of the ultra-violet seems more important than the intensity, since tripling the intensity barely doubles the effect.—*Oran Raber.*

TOXIC AGENTS

1188. Fellers, C. R., and R. S. Dearstyne. **Relation of water to milk-borne typhoid.** Jour. Dairy Sci. 8: 146–167. 1925.—An investigation into the longevity of certain bacteria of the typhoid group upon dairy utensils and in water, of the extent of pollution of certain dairy farm water supplies, and of the efficiency of various methods of washing and sterilizing dairy utensils, particularly bottles, clearly shows that considerable precautions must be taken to safeguard the milk supply from the ever-present danger of infection by the water supply, that the use of NaOCl is equal or superior to steam for the sterilization of milk bottles and dairy utensils, that so-called "hot-water" washing is inefficient and unsatisfactory from a bacteriological standpoint, and that as a final safeguard the milk should be efficiently pasteurized.—*Arthur P. Miller.* (*From Chemical Abstracts.*)

1189. McGuinn, Albert F. **The action of dicyandiamid and guanyl urea sulfate on plant growth.** Soil Sci. 17: 487–500. 1924.—Dicyandiamid or guanyl urea sulphate applied in small quantities in direct contact with corn grains did not affect the germination nor seedling growth. Dicyandiamid when applied to soil in large amounts is slightly toxic to barley; in smaller amounts it produces tip burning but does not retard growth. In Shive's best solution, R_5C_2, dicyandiamid up to 63 parts per million did not injure soy bean plants. Guanyl urea sulphate was not toxic to barley in soil culture. Both substances affect nitrification but do not affect ammonification. Neither affects the number of bacteria or fungi in the soil. Dicyandiamid is very stable in the soil but guanyl urea sulphate decomposes very slowly to NH_3.—*W. J. Robbins.*

1190. Nicolaisen. **Beizversuch zu Buschbohnen. [Bush beans treated with a corrosive.]** Gartenwelt 28: 158. 1924.—The varieties "Gelbe Pariser" and "Gelbe Eierbohne" were treated with Uspulun; 3 days after germination the plants treated with ¼% solution of Uspulun showed better leaves than the control.—*J. C. Th. Uphof.*

1191. Nicolas, E., et G. Nicolas. **Observations sur l'influence de l'urée, de la sulfo-urée et de l'allylsulfo-urée sur les végétaux supérieurs. [Observations on the influence of urea, sulpho-urea, and of allylsulpho-urea on higher plants.]** Compt. Rend. Acad. Sci. Paris 180: 1286–1289. 1925.—The bean, white mustard, and radish were used. The experiments show that urea stimulates development but sulpho-urea and allylosulpho-urea are toxic.—*C. H. Farr.*

1192. Peters, Rudolph A. **The action of nitrous acid upon the antineuritic properties of yeast extracts.** (Abstract.) Jour. Physiol. 59: xxxii. 1924.—Yeast extract treated with nitrite for several hours retained its curative properties for pigeons suffering from symptoms of head retraction, thus apparently indicating that the effective material in yeast is not a primary amine. A large number of secondary amines are also excluded from consideration.—*Ernest S. Reynolds.*

1193. Rockwell, G. E., and E. G. Ebertz. **How salts preserve.** Jour. Infect. Diseases 35: 573–575. 1925.—The preserving action of salt on proteins is not completely explained by its dehydrating action. Other factors of importance are the direct effect of the chlorine ion, its effect on dispelling oxygen, and its interference with enzyme action.—*R. L. Starkey.*

1194. Schulz, E. R., and Noel F. Thompson. **Some effects of sodium arsenite when used to kill the common barberry.** U. S. Dept. Agric. Dept. Bull. 1316. *1–18. Pl. 1–14, fig. 1.* 1925.—A comparison of arsenious acid, 2 sodium arsenite solutions containing different amounts of sodium, and of sodium arsenate, showed that the acid was the most toxic to plants, and the sodium arsenite with the least sodium was second. The absorption of sodium arsenite by common barberries from a solution applied to the ground around the base of the bushes was rapid. Analyses showed the presence of arsenic in all parts of such barberries except the seed. When applied to the leaves and stems very little of the arsenic was absorbed and only local injury resulted. Similar results were secured with a number of other plants and the percentages of arsenic found in the issues are reported. The arsenic determinations were made by

means of a modified volumetric method devised for the determination of small amounts of arsenic in plant tissues. This method is fully described. A number of fatalities among farm animals incidental to the use of sodium arsenite as a weed killer are reported. The rapid leaching of arsenic from the surface soil was demonstrated.—*N. F. Thompson.*

1195. Voegtlin, Carl, J. M. Johnson, and Helen A. Dyer. **Protoplasmic action of copper and gold.** Proc. Nation. Acad. Sci. [U. S. A.] **11**: 344–345. 1925.—Although gold and cooper are toxic in very dilute solutions, the toxic threshold is raised when the amount of protoplasm exposed to a given amount of solution is increased—a fact which indicates that the toxic effect is chemical. Experiments here reported indicate that the toxicity may be due to disturbance of the glutathione equilibrium; formula is given. Glutathione in its reduced form (R.SH) reacts with copper sulphate and gold chloride to form compounds. Albino rats were protected from the effects of both lethal and sublethal doses of sodium cupritartrate by either glutathione or cystein (glutathione is a dipeptid of glutamic acid and cystein). Similar results were secured with sodium gold chloride. Other amino acids, lecithin, and other protoplasmic constituents did not detoxify. Protection by glutathione against $CUSO_4$ was also observed with *Spirogyra* and tadpoles.—*Howard B. Frost.*

1196. Walker, John E. **The germicidal properties of chemically pure soaps.** Jour. Infect. Diseases **35**: 557–566. 1924.—Solutions of N/5 sodium and potassium salts of 3 of the lower acids, butyric, valeric, and caproic, lacked germicidal properties. Such salts of caprylic, capric, lauric, myristic, palmitic, stearic, oleic, linolic, and linolenic acids were studied in respect to their action on *Pneumococcus*, *Streptococcus*, *Staphylococcus*, and *Bacillus typhosus*. *Staphylococcus aureus* appears generally to be quite resistant to germicidal effects of the soaps. Laurates possess the most general germicidal properties, caprylates were very weak, and caprates, myristates, palmitates and stearates were somewhat intermediate. In general, salts of the unsaturated acids were most active as germicides. Blood serum reduced the intensity of germicidal action. Action was stronger at the higer temperatures.—*R. L. Starkey.*

1197. Walker, John E. **The germicidal properties of soap.** Jour. Infect. Diseases **37**: 181–192. 1925.—A number of commercial soaps as well as soaps prepared in the laboratory from glycerides of common fatty acids were studied as disinfectants. A 1:160 solution of any of the soaps killed the diphtheria bacillus and *Streptococcus hemolyticus* in 2.5 minutes at 20°C. *Staphylococcus aureus* resisted action of all the soaps at 20° for 15 minutes and all but brown bar soap at 35° for 15 minutes. Even after thoroughly washing the hands, *Staphylococcus albus* was not destroyed or completely removed. Other organisms did not appear to resist such washing. *Strep. hemolyticus* was destroyed by washing for 1 minute with any of the soaps, when a good lather was formed. Coconut oil soap was the only one destroying *Bacillus coli* with vigorous washing. The soaps had a strong germicidal action on organisms contained in saliva. The soaps in general were strongly germicidal for the pneumococcus, streptococcus and diphtheria bacillus. The presence of coconut oil in greater amounts would render the soaps more germicidal toward *B. typhosus* as well. The greater germicidal action of coconut oil soap is believed to be due to its higher content of saturated fatty acids.—*R. L. Starkey.*

ELECTRICITY AND MECHANICAL AGENTS

1198. Waller, J. C. **On the fluctuations of potential in green leaves under the influence of light.** (Abstract.) Jour. Physiol. **58**: XXXVIII–XXXIX. *1 fig.* 1924.—Fluctuations in electric potential take place in a green leaf when illuminated by an electric light, with the heat eliminated. A positive change in potential is favored when the amount of CO_2 is increased, either directly, or indirectly by keeping the leaf in darkness before the test. It is suggested as a special application of Hering's theory that positive effects are associated with synthesis, while negative effects indicate predominant respirational activity.—*Ernest S. Reynolds.*

MISCELLANEOUS

1199. Bond, J. D. **Defecation in cane sugar manufacture.** Internat. Sugar Jour. **27**: 311–317. 1925.—The differing views of some of the leading sugar technologists regarding the actual mechanism of lime in the defecation process are outlined and some suggestive remarks

made regarding the somewhat misunderstood terms "albuminoids" and "colloids." Coarse dispersoids and colloids are discussed and a table shows the results from filtering cane juice through paper, kieselguhr, and glass wool. Sixteen tables set forth the results of a study of factors governing defecation, each table being accompanied with a brief account of the procedure and analysis of results. The tables show influence of gums and organic non-sugars; data on colloids; relation of gums to the defecation process; character of the ash; CaO and P_2O_5 relations in the precipitate; result of removal of phosphates from the juice; influence of organic matter; result of defecation by inorganic reactions; relations between liming and volume of settlings and between liming and the ratio of CaO to P_2O_5; relation of CaO and P_2O_5 in juice and precipitate; analysis of clarified juices and precipitates for CaO, P_2O_5, and MgO; data on a juice the reaction of which was increased in small steps; on cold juices clarified without heating; influence of organic acids; data on buffer action of juice; and relation of pH values in the various steps of clarification in the factory. The author concludes that "the actions taking place in defecation are influenced by so many varying factors that their formation will be difficult if not impossible."—*Nellie E. Fealy.*

1200. Mulsow, F. W. **Culture mediums for the gonococcus.** Jour. Infect. Diseases **36**: 419–423. 1925.

1201. Plantefol, L. **La technique des analyses d'air avec l'appareil de Laulanie.** [**The technique of analyses of air with Laulanie's apparatus.**] Bull. Soc. Chim. Biol. **7**: 590–605. 1925.—This is a description of the instrument, with detailed statements of the precautions to be employed in its use.—*Joseph S. Caldwell.*

1202. Smith, C. M. **The alkaline reaction of the dew on cotton plants.** Science **61**: 572–573. 1925.—In reply to criticism of his earlier statements concerning the fact and cause of the alkaline reaction in liquid on the surface of leaves of the cotton plant, the author points out that the carbonates present would provide sufficient hydroxyl ions to affect the indicator used (phenolphthalein). He also quotes evidence of a similar case with *Phaseolus multiflorus* Willd.—*C. J. Lyon.*

1203. Trenél, M. **Ueber ein einfaches Gerät zur elektrometrischen Bestimmung der Wasserstoffionenkonzentration.** ("**Boden-azidität.**") [**A simple apparatus for the electrometric determination of hydrogen-ion concentration.** (**Soil Acidity.**)] Zeitschr. Pflanzenernähr. u. Düngung **4**: 239–241. 1925.—A description of the apparatus and results with its use are given.—*F. M. Schertz.*

1204. Willis, Marion A. **An apparatus for testing the breaking strength of straw.** Jour. Amer. Soc. Agron. **17**: 334–335. 1925.—The apparatus is fully described and a figure is given to show the manner of operation.—*F. M. Schertz.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*
E. B. Payson, *Assistant Edtior*

(See also in this issue Entries 15, 29, 35, 50, 63, 78, 106, 125, 126, 159, 160, 175, 176, 177, 307, 317, 323, 327, 348, 480, 481, 598, 698, 713, 736, 744, 997)

GENERAL

1205. Bonnier, Gaston. **Flore complète illustrèe en couleurs de France Suisse et Belgique.** [**Complete flora, illustrated in color, of France, Switzerland, and Belgium.**] *4to* Vol. 5 (Fasc. 41–50). *P. 1–116. Pl. 241–300;* Vol. 6 (Fasc. 51–60). *P. 1–103. Pl. 301–360;* Vol. 7 (Fasc. 61–70.) *P. 1–158. Pl. 361–420.* Librairie Général de l'Enseignement: Paris, (without date).—These volumes continue consistently the plan of previous volumes published and include *Conopodium* of the Umbelliferae with successive families through to *Echium* of the Borraginaceae, following essentially the sequence of Bentham and Hooker's "Genera Plantarum." [See also Bot. Absts. 10, Entry 339.]—*J. M. Greenman.*

1206. Fiori, Adriano. **Nuova Flora Analitica d'Italia.** [**New analytical flora of Italy.**] *Roy. 8vo.* Vol. 1. *944 p. 12 fig.* M. Ricci: Florence, Italy, 1923–1925.—The present volume of this work, which has appeared in 6 fascicles, covers the ferns, fern-allies, and the phanerogams from the Coniferae to the genus *Vigna* of the Leguminosae. The families are arranged in accordance with the sequence of Engler and Prantl's Natürlichen Pflanzenfamilien. Concise dichotomous keys are provided for the determination of families and genera, and extended keys are introduced for the identification of species and subordinate categories. A limited amount of bibliography and synonymy are given. The following names are indicated as new combinations: *Polystichum Filix-mas* Roth δ *paleaceum* (*Nephrodium Filix-mas* f. *paleaceum Fiori*), *Arundo Phragmites* L. δ *Marsillyana* (*Phragmites chrysantha* var. *Marsillyana* Mab.), *Koeleria vallesiana* Bert. β *pectinata* (*K. tuberosa* var. *setacea* Pers.), *Festuca nemorosa* D. Torre & S. β *croatica* (*F. spectabilis* subsp. *affinis* var. *croatica* Hack.), *Nardurus tenellus* Parl. β *festucoides* (*N. Halleri* var. *festucoides* Fiori), *Ceratochloa unioloides* P. B. α *lasiophylla* (*Bromus Schraderi* α *lasiophylla* Gior.) and β *leiophylla* (*B. Schraderi* β *leiophylla* Gior.), *Agropyrum repens* P. B. γ *arenosum* (*A. intermedium* var. *arenosum* Thell.) and ε *villosum* (*Triticum glaucum* var. *villosum* Sadl.), *Iris Sisyrinchium* L. β *sicula* (*Gynandriris sicula* Tod.), *Orchis pyramidalis* L. β *Urvilleana* (*O. condensata* Urv., not Desf.), *Alnus minor* Chiov. γ *Foucaudii* (*A. viridis* var. *Foucaudii* Briq.), *Aristolochia longa* L. δ *istriaca* (*A. pallida* var. *istriaca* Pamp.), *Paronychia Kapela* Kern. α *Haquetii* (*P. serpyllifolia* var. *Haquetii* Bartl.), *Alsine mucronata* L. β *Burnatii* (*A. Burnatii* Rouy & Fouc.), *A. verna* Whlnb. β *grandiflora* (*Minuartia verna* var. *grandiflora* Hayek), *A. geniculata* Strobl α *Poiretiana* (*Rhodalsine geniculata* α Poiret), *Arenaria Bertolonii* Fiori β *Salisii* (*A. saxifraga* var. *Salisii* Briq.), *A. Bertolonii* γ *Burnatii* (*A. saxifraga* var. *Burnatii* Briq.), *A. Bertolonii* δ *Morisii* (*Stellaria saxifraga* Moris), *Moehringia bavarica* Kern. γ *Tendae* (*M. dasyphylla* var. *Tendae* Burnat), *Stellaria Alsine* Grimm β *alpina* (*S. uliginosa* var. *alpina* Guerke), *Cerastium alpinum* L. η *Biadegii* (*C. latifolia* subsp. *Biadegii* Chiov.), *Silene quadrifida* L. δ *ticinensis* (*Heliosperma quadrifida* var. *ticinensis* H. Neum.), *Sisymbrium orientale* L. β *ligusticum* (*S. Columnae* var. *ligusticum* D Ntrs.), *Eruca sativa* Mill. γ *erysimoides* (*E. pinnata* Presl.), *Aethionema saxatile* R. Br. β *marginatum* (*A. saxatile* var. *ovalifolium* DC.), *Papaver Rhoeas* L. δ *angustifolium* (*P. obtusifolium* var. *angustifolium* Tin.), *Ranunculus flabellatus* Desf. γ *paludosus* (*R. chaerophyllus* β *flabellatus* **paludosus* Moris), *R. montanus* W. β *aurimontanus* (*R. geraniifolius* var. *aurimontanus* Briq.), *Helleborus trifolius* Mill. β *serratifolius* (*H. lividus* var. *serratifolius* DC.), *Berberis vulgaris* L. β *calabarica* (*B. aetnensis* var. *calabarica* C. K. Schneider), *Saxifraga autumnalis* L. δ *dentifera* (*S. aizoides* var. *dentifera* Beck), *S. caesia* L. δ *Grappae* (*S. squarrosa* var. *Grappae* C. Massal.), *S. oppositifolia* L. ε *appennina* (*S. meridionalis* var. *appennina* A. Terr.), *Poterium officinale* Gray β *dodecandroides* (*Sanguisorba officinalis* var. *dodecandroides* Ugolini), *Pirus Cydonia* L. α *maliformis* (*Cydonia piriformis* Med.), *Genista decumbens* W. β *elata* (*G. procumbens* var. *elata* Ten.), *Medicago italica* Steud. β *aculeata* (*M. obscura* var. *aculeata* Guss.), *M. italica* Steud. δ *spinosa* (*M. Helix* var. *spinosa* Guss.), *M. truncatula* Gaertn. β *cosyrensis* (*M. tribuloides* var. *cosyrensis* Somm.), *Melilotus sicula* Jacks. β *stoechadica* (*M. messanensis* var. *stoechadica* O. E. Schulz), *M. sulcata* Desf. δ *Salzmannii* (*M. segetalis* var. *Salzmannii* O. E. Schulz), *Trifolium pratense* L. γ *silanum* (*T. pratense* var. *bracteatum* f. *silanum* Fiori), *Astragalus montanus* L. α *occidentalis* (*Oxytropis montanus* var. *occidentalis* Asch. & Gr.), *A. uralensis* L. δ *intricans* (*A. variabilis* δ *intricans* Rouy), and *Vicia ervoides* Fiori β *uniflora* (*V. Lenticula* b. *uniflora* Fiori).—*J. M. Greenman.*

1207. Fiori, Adriano. **Nuova Flora Analitica d'Italia.** [**New analytical flora of Italy.**] Vol. 2. Fasc. 1. *P. 1–160. Fig. 13–14.* M. Ricci: Florence, 1925.—This fascicle carries the work forward from the Myrtaceae to the genus *Stegia* of the Malvaceae. The following new combinations are indicated: *Lythrum tribracteatum* Salzm. β *major* (*L. Thymifolia* β *major* DC.), *Meum Mutellina* Gaertn. β *longifolium* (*Ligusticum longifolium* Beauv.), *Scandix Pecten-Veneris* L. β *cottiana* (*S. hispanica* Boiss. var. *cottiana* Gola), *Polygala vulgaris* L. ι *corsica* (*P. nicaeënsis* Risso subsp. *mediterranea* var. *corsica* Chodat), *P. vulgaris* L. η *italiana* (*P. nicaeënsis* subsp. *mediterranea* var. *italiana* Chodat), *P. vulgaris* L. ξ *confusa* (*P. nicaeënsis* var. *confusa* Burn.), *P. vulgaris* L. π *adriatica* (*P. nicaeënsis* subsp. *mediterranea* var. *adriatica* Chodat), *Geranium Robertianum* L. γ *montanum* (*G. lucidum* var. *montanum* N. Terr.),

Erodium malacoides L'Hér. δ *Linosae* (*E. angulatum* Pomel var. *Linosae* Somm.), *E. cicutarium* L'Hér. η *subacaule* (*E. Jacquinianum* var. *subacaule* Boiss. & R.), and *Malope malachoides* L. γ *pedunculata* (*M. malachoides* var. *sinuata* Guss.).—*J. M. Greenman.*

1208. Groff, G. W. **A method of indexing and filing Chinese plants illustrated by a systematic enumeration of the plants of the Canton Christian College campus.** Lingnaam Agric. Rev. 1[1]: 47–65. 1922.—"Indexes to Chinese plant names that give the corresponding Latin names are indispensible in bringing together Chinese and Western knowledge concerning plants." Mention is made of earlier efforts in this direction, particularly those of Professor Jinzo Matsumura's "Chinese Names of plants" and of the "Radical and Subradical Index to Chinese Plant Names listed in J. Matsumura Shokubutsu Mei-I," prepared by Caroline R. Byrd and Katharine H. Wead. A national system of indexing plants is to be desired as an aid to the work of the botanist, horticulturalist, and ethnologist. The history and development of the Canton Christian College Herbarium is briefly outlined. F. A. McClure's 2 collecting trips to the Island of Hainan are mentioned. In 1920 a 3-part index of the plants of Kwangtung Province was arranged and photographed at Washington, D. C. This includes: (1) A list in Chinese character arranged according to the radicals and subradicals in Poletti's Dictionary; (2) a list of the names romanized according to the Eitel-Genahr Dictionary; and (3) a systematic enumeration of the plants according to the Engler and Prantl arrangement, with De Dalla Torre and Harms' generic numbers also given. The plants filed in the herbarium are arranged in this same order. A composite classification number is assigned to each specimen, including the Engler and Prantl family number and the De Dalla Torre and Harms' genus number. The value of this numerical arrangement is briefly discussed. Emphasis is placed upon the need for a national system of Chinese plant names to supplant many local names now in use. An effort has been made in this direction with the help of Chung Kuan-kuang. Three tables are given, presenting portions of : (1) A systematic classification of the plants of the College Campus; (2) an alphabetical list of local names (Cantonese romanization) for (1); and (3) a Chinese character index. These serve to illustrate the plan explained herein. A bibliography of over 40 titles is given.—*Albert N. Steward.*

1209. Jávorka, S. **Magyar Flora. Flora Hungarica. [Manual for the determination of the phanerogams and vascular cryptogams of Hungary.]** Vol. 1. *400 p.*; Vol. 2. *400 p.* Edit. "Studium:" Budapest, 1924.—Each species is completely described, its Hungarian habitat fully indicated, and its general geographical distribution given. The Hungarian names of individual species, the clear analytical keys to each systematic rank, enumeration of the smallest units (forms, sports, etc.), as well as hybrids, give such a complete picture of the Hungarian flora that the usefulness of the work will extend far beyond the borders of Hungary; and on account of the geographical situation this book will have a great interest in other countries. Several specialists have coöperated in the work. The genus *Rosa* was elaborated by A. de Degen, *Aconitum* and *Rubus* by Gy. Gayer, and *Vitis* by J. Andrasovszky. Several new species are described here for the first time. The 2nd volume closes with the Ericaceae.—*I. Györffy (translated).*

1210. Marret, L., G. Beauverd, et H. Correvon. **Icones florae alpinae plantarum. [Illustrations of plants of the alpine flora.]** 3rd Sér. *69 pl.* Paul Lechevalier: Paris, 1924.—This series consists of 50 selected species from 14 genera and 8 families representing primarily the alpine flora of Europe and incidentally of Asia and North America. Each species is illustrated by one or more full-page heliotyped plates, accompanied by copious descriptive matter, numerous text-figures, and a distribution map. The plants treated in the present series are: *Thlaspi rotundifolium* Gaud., *Hutchinsia alpina* R. Br., *H. brevicaulis* Hoppe, *Viola nummularifolia* All., *Viscaria alpina* Fenzl., *Saponaria caespitosa* DC., *Arenaria biflora* L., *A. ciliata* L., *A. cretica* Spr., *A. purpurascens* Ram., *Alsine juniperina* Fzl., *Potentilla Clusiana* Jacq., *P. grammopetala* Moret., *P. Valderia* L., *Saxifraga muscoides* All., *S. nivalis* L., *Artemisia borealis* Pallas, *A. granatensis* Boiss., *Leontopodium alpinum* Cassini, *Phyteuma hemisphericum* L., *P. hedraianthifolium* R. Schultz., *P. humile* Schleicher, *P. pauciflorum* (L.) S. & H., *P. pedemontanum* R. Schultz, *P. globularifolium* S. & H., *Gentiana bavarica* L., *G. terglouensis* Hacq., *G. nana* Wulf, *G. nivalis* L., *G. pumila* Jacq., *G. tenella* Rottb., *G. verna* L., *Linaria alpina* Mill., *Soldanella pusilla* Bmg., *Primula longiflora* All., *P. Auricula* L., *P.*

Carniolica Jacq., *P. marginata* Curt., *P. latifolia* Lap., *P. Clusiana* Tausch., *P. glaucescens* Moretti, *P. Wulfeniana* Schott, *P. Cottia* Widmer, *P. oenensis* Thom., *P. pedemontana* Thom., *P. viscosa* Vill., *P. Allionii* Loiseleur, *P. integrifolia* L., *P. tyrolensis* Schott, and *P. minima* L. —*Emery R. Ranker.*

1211. Nakai, T. **Joseph Banks: Icones selectae plantarum quas in Japonia collegit et delineavit Engelbertus Kaempfer. [Illustrations of selected plants which were collected in Japan and figured by Engelbertus Kaempfer.]** Jour. Arnold Arboretum 6: 186–188. 1925.—The names according to modern nomenclature of the 59 plants figured by Kaempfer are given. Of these plants 32 bore botanical names given by Banks while the rest had only Japanese names.—*Alfred Rehder.*

1212. Standley, Paul C., y Salvador Calderón. **Lista preliminar de las plantas de el Salvador. [Preliminary list of the plants of Salvador.]** *8vo. 274 p.* Dutriz Hermanos: San Salvador, 1925.—This list includes both non-vascular and vascular plants. Several specialists have cooperated with the authors in the identification of plants of particular groups. Numerous species and varieties are designated as new, but few of them are accompanied by descriptions and these have been previously published.—*J. M. Greenman.*

1213. Szabó, Z. **Utmutató a virágos növények és harasztok gyüjtésére, konzerválására és növénygyüjtemények berendezésére. [Index to the collections of Phanerogams and Pteridophytes preserved and grouped in the herbarium.]** *iii + 54 p. 34 fig.* Kiadó [Press] Kir. magy. Természettudományi Társulat: Budapest, 1924.

PTERIDOPHYTES

1214. Christensen, Carl, and Carl Skottsberg. **The Pteridophyta of the Juan Fernandez Islands.** [In: Skottsberg, Carl. Editor. **The natural history of Juan Fernandez and Easter Island. Vol. II. Part I. Botany.**] *P. 1–46.* Almquist & Wiksells: Upsala, 1920.—This paper contains a critical revision of all Pteridophyta known from the islands of Juan Fernandez as worked out by Christensen, while Skottsberg has contributed the exact data about localities and distribution within the islands. The paper is based on the large collection made by Skottsberg in 1908 and 1916–1917; he has succeeded in finding 12 species hitherto unknown from the islands. The total number of species is 51, of which 17 are endemic in the islands, making the percentage of endemic species very high (33.3). The fern-flora is a mixture of American and southern Polynesian elements, the former in preponderance. Three species, *Hymenophyllum Ingae, Trichomanes rugosum,* and *Ophioglossum fernandezianum* are described as new, and like some other interesting species, illustrated. The paper contains numerous corrections to an earlier enumeration by F. Johow in "Los Helechos de Juan Fernandez 1893."—*Carl Christensen.*

1215. Christensen, Carl, and Carl Skottsberg. **The ferns of Easter Island.** (In: Skottsberg, Carl. Editor. **The natural history of Juan Fernandez and Easter Island. Vol. II. Part I. Botany.**) *P. 47–53.* Almquist & Wiksells: Upsala, 1920.—In the 2nd paper the Pteriophyta collected by Mr. and Mrs. Skottsberg in Easter Island, June 1917, are enumerated with critical notes and drawings by Christensen. A new species, *Doodia paschalis,* is described. The number of species known from the island is 12, all Polynesian but the endemic *Dryopteris Espinosai* Hicken which is closely related to the American *D. patula.*—*Carl Christensen.*

1216. Copeland, E. B. **Few new ferns from Mt. Bulusan.** Leaflets Philippine Bot. 9: 3107–3111. 1920.—The following new species of ferns from Mt. Bulusan, Philippine Islands, are described: *Davallia Elmeri, Dennstaedtia philippinensis, Cyathea bicolana, C. bulusanensis, Haplodictyum majus,* and *Athyrium ebenirachis; Haplodictyum heterophyllum* Presl is recorded from Mt. Bulusan and from Lake Polog, both stations are in the Province of Sorsogon. —*J. M. Greenman.*

1217. Trotter, A. **"Marsilia aegyptiaca Willd." nuovo inquiline della flora Libica. [Marsilia aegyptiaca Willd. a new member of the Libyan flora.]** Bull. Soc. Bot. Italiana 1924[6]: 132–134. 1924.—The author discovered on the coast of Tripoli (near Sabathra) an interesting plant which is new for the flora of Libya and likewise for the flora of northern Africa and

which is known only in Gabes (South Tunis) and in Egypt. Two new forms are distinguished, namely, *Marsilia aegyptiaca* Willd. f. *terrestris* Trotter and *M. aegyptiaca* Willd. f. *aquatica* Trotter.—*Author (translated by R. V. La Garde).*

SPERMATOPHYTES

1218. Anonymous. **Novitates Africanae.** Ann. Bolus Herb. **3**: 159–184. *Pl. 7–9.* 1923. —A number of new plants are described and illustrated, the majority of them being species of *Mesembrianthemum* and *Erica* collected in the Cape Province. The following species of *Mesembrianthemum* are described by L. Bolus: *Mesembrianthemum cupreum, M. anemoniflorum, M. primulinum M. curtophyllum, M. platycalyx, M. Schollii* Salm Dyck var. *caledonicum, M. Duthieae, M. Comptonii, M. Edwardsiae, M. amplexicaule, M. flaccidum, M. miserum, M. crateriforme, M. cyathiforme, M. explanatum, M. angustipetalum, M. diutinum, M. politum, M. Henricii, M. saturatum, M. Marianae, M. cymosum, M. Lerouxiae, M. intermedium,* and *M. aberdeenense.* The species of *Erica,* also described by L. Bolus, are the following: *Erica Nevillei, E. quadrisulcata, E. fervida, E. coruscans, E. Eylesii, E. cincta, E. fontana, E. limosa, E. paludicola, E. utriculosa, E. saxatilis, E. montana, E. autumnalis, E. Duthieae, E. barrydalensis,* and *E. sociorum.* Other plants described are: *Blaeria Muirii* L. Guthrie, *Philippia pallida* L. Guthrie, *Thoracosperma Muirii* L. Guthrie, *T. radicans,* L. Guthrie, *Gladiolus Muirii* L. Bolus, *G. crispulatus* L. Bolus, *G. Louiseae* L. Bolus, *G. Blommesteinii* and var. *major* L. Bolus, and *Eucomis Pillansii* L. Guthrie.—*E. M. Doidge.*

1219. Anonymous. **Novitates Africanae.** Ann. Bolus Herb. **4**: 1–30. *Pl. 1, 2 fig.* 1925. —A number of species of *Mesembrianthemum,* for the most part collected in the Cape Province are described by L. Bolus. These are: *Mesembrianthemum stenophyllum, M. suppositum, M. angulipes, M. Cookii, M. maritimum, M. albertiniense, M. pentagonum, M. triticiforme, M. Putterillii, M. Phillipsii, M. calcicolum, M. Stayneri, M. leucantherum, M. Victoris, M. calandrum, M. argenteum, M. Arbuthnotiae, M. karrooicum, M. montaguense, M. promontorii, M. stenopetalum, M. constrictum, M. delum, M. planum, M. Giffenii, M. aereum* and var. *alba, M. Pottsii, M. vinaceum,* and *M. sinuosum.* The following plants are also described by L. Bolus. *Cenia Duckittiae, Gazania Pottsii, Erica latituba, E. tenax, E. Thomae* and var. *brevisepala, E. Gysbertii* Guthrie & Bolus vars. *longiflora* and *ampliata, E. intonsa, E. lananthera, E. Savilea* Andr. var. *mutica, E. fastigiata* L. var. *longituba, E. velitaris* Salisb. var. *parvibracteata,* E. *curvirostris* Salisb. var. *longisepala, E. cyathiformis* Salisb. var. *orientalis, E. truncata, Tritonia coccinea, Babiana Vanzijliae, Gladiolus Geardii, Cyrtanthus Stayneri.* L. Guthrie has described *Phillipia Stokoei, Blaeria oppositifolia, Thoracosperma rosaceum, T. viscidum, Acrostemon Fourcadei, A. Stokoei, Protea oleracea, Aristea Stokoei,* and *Bulbine crocea.* Other plants described are *Watsonia vittata* Mathews & L. Bolus, *W. Ardernei* Mathews & L. Bolus, *W. Wordsworthiana* Mathews & L. Bolus, *W. Fourcadei* Mathews & L. Bolus, *Eriospermum graminifolium* A. Duthie, *E. fasciculatum* A. Duthie, and *E. confertum* var. *aureum* A. Duthie.—*E. M. Doidge.*

1220. [Arnol'd, V. M.] Арнольд, В. М. **К вопросу о клас сификации. Panicum Miliaceum. [A contribution to the classification of Panicum miliaceum L.]** Труды по Прикладной Ботанике и Селекции. [Bull. Appl. Bot. and Plantbreed.] **14**[1]: 252–270. 1925.—Each of the 3 principal groups (*Effusum, Contractum, Compactum*) embraces too great a morphological diversity and has been subdivided into narrower units, 12 principal types. Each type has its advantages and deficiencies. A table has been drawn up giving the systematic classification of *P. miliaceum* L. according to the color of the grain. Thirteen newly described varieties have been introduced into classification. Three additional colors for the glumes are introduced, namely, glumes light-yellow, greenish, and dark (sordid). The differences in regard to shape and size of the grain fall into the 6 types, large (globose, elongated, long) and small (globose, elongated, long).—*E. Barulina.*

1221. Beck, G. **Plantae europaeae hactenus non indicatae. 1.** [New European plants.] Repert. Spec. Nov. Regni Veg. **17**: 449–451. 1921.—(Repert. Eur. et Med. **1**: 449–451. 1921.) —The following new plants, mostly from Bohemia and southern Austria, are described: *Helianthemum chamaecistus* Miller f. *maculatum, H. chamaecistus* × *grandiflorum* (*H. istriacum*),

Viola hirta L. var. *gymnocarpa*, *V. collina* × *odorata* (*V. subcollina*), *V. cyanea* × *odorata* (*V. praesignis*), *V. arvensis* × *saxatilis* (*V. bohemica*), *Geranium pratense* L. var. *parviflorum*, *Dictamnus albus* L. var. *gynodynamica*, *Polygala amarum* × *comosum* (*P. persimile*), *Cotinus coggygria* Scop. var. *parvifolia*, *Euonymus vulgaris* Scop. var. *microphyllus*, *E. latifolius* Miller var. *eximius*, *Paliurus spina-Christi* Miller vars. *rotundifolius*, *macrocarpus* and *apterus*, *Frangula vulgaris* Hill. var. *parvifolia*, *F. rupestris* × *vulgaris* (*F. anceps*), and *Rhamnus catharticus* L. var. *microphyllus*.—*John E. Dinsmore.*

1222. Bolus, H. M. L. **South African orchids.** Ann. Bolus Herb. **4**: 31–36. *Pl. 2–6.* 1925.—Five orchids are described and figured, namely, *Eulophia Dregeana* Lindl., *E. arenaria* Bolus, *E. clitellifer* Bolus var. *major*, *Habenaria natalensis* Reichb. f. and *H. Barbertoni* Kraenz. & Schlecht.—*E. M. Doidge.*

1223. Bornmüller, J. **Allium trichocoleum Bornm., eine neue Art der Sektion Haplostemon (Schoenoprasum) aus Palästina.** [**A new Allium species from Palestine.**] Repert. Spec. Nov. Regni Veg. **17**: 452–453. 1921. (Repert. Eur. et Med. **1**: 452, 453. 1921).—A new *Allium* from Jerusalem is described and notes are added concerning *A. Hierosolymorum* Regel and *A. Sprengeri* Regel.—*John E. Dinsmore.*

1224. Bornmüller, J. **Centaurea cylindrocephala Bornm. (spec. nov. sect. Acrolophus-Paniculatae).** Repert. Spec. Nov. Regni Veg. **17**: 453–455. 1921. (Repert. Eur. et Med. **1**: 453–455. 1921).—A description is given of this new species from northern Macedonia.—*John E. Dinsmore.*

1225. Bornmüller, J. **Galium silvaticum L. var. (nov.) oppositifolium Bornm.** Repert. Spec. Nov. Regni Veg. **17**: 279–280. 1921. (Repert. Eur. et Med. **1**: 439–440. 1921).—The characteristics of this new variety from Thuringia are given.—*John E. Dinsmore.*

1226. Bornmüller, J. **Notiz über die synonymik der Vicia tricuspidata Stev.** [**Synonyms of Vicia tricuspidata Stev.**] Repert. Spec. Nov. Regni Veg. **17**: 280–282. 1921. (Repert. Eur. et Med. **1**: 440–442. 1921).—Proof is given that the correct name is *Lathyrus saxatilis* (Vent.) Vis. (*Vicia tricuspidata* Stev.).—*John E. Dinsmore.*

1227. Bornmüller, J. **Über eine neue Solenanthus—Art aus dem Balkan.** [**A new species of Solenanthus from the Balkans.**] Repert. Spec. Nov. Regni Veg. **17**: 276–279. 1921. (Repert. Eur. et Med. **1**: 436–439. 1921).—A full description is given of *Solenanthus scardicus* n.sp. from west Macedonia on the borders of Albania.—*John E. Dinsmore.*

1228. Bornmüller, J. **Zur Gattung Ballota L.** [**The genus Ballota L.**] Repert. Spec. Nov. Regni Veg. **17**: 282–286. 1921. (Repert. Eur. et Med. **1**: 442–446. 1921).—A description is given of *Ballota nigra* L. var. *Zobelii* n.var. from Möst, near Dessau, and of *B. Philistaea* from Ascalon. The last had been previously given as *B. nigra* L. var. *ampliata* Hausskn. & Bornm.—*John E. Dinsmore.*

1229. Bornmüller, J. **Zur Gattung Filago. Neue Art und Formen aus Persien, Palästine und Ägypten.** [**New species and forms of the genus Filago from Persia, Palestine and Egypt.**] Repert. Spec. Nov. Regni Veg. **18**: 40–43. 1922. (Repert. Eur. et Med. **1**: 472–475. 1922).—The following are described: *Filago Bornmülleri* Hausskn. from southeastern Persia, and *F. spathulata* Presl var. *Alexandrina* Bornm. from Egypt and Palestine.—*John E. Dinsmore.*

1230. Bornmüller, J. **Zwei neue Arten aus Süd-Palästina.** [**Two new species from South Palestine.**] Repert. Spec. Nov. Regni Veg. **17**: 273–276. 1921. (Repert. Eur. et Med. **1**: 433–436. 1921).—Full diagnoses are given of 2 new species: *Centaurea calcitrapella* Bornm. & Dinsm. from Ghor es-Safiyeh on the Dead Sea, and *Bassia joppensis* Bornm. & Dinsm. from Jaffa.—*John E. Dinsmore.*

1231. Borza, Al. **Despre câteva Centauree din România.** [**Centaureas from Rumania.**] Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **4**: 33–37. *1 pl., 2 fig.* 1924.—A new scapiform Centaurea from Bessarabia is described and figured, as *C. diffusa* Lam. f. *basarabensis* Borza. *Centaurea dacica* Borza has been cultivated in the Botanical Garden of Cluj and has conserved the distinctive characters recorded in the original diagnosis.—*E. Pop.*

1232. Borza, Al. **Plantae novae romanicae.** [**New Rumanian plants.**] Repert. Spec. Nov. Regni Veg. **17**: 458–459. 1921. (Repert. Eur. et Med. **1**: 458–459. 1921).—Descriptions are given of the following: *Melampyrum nemorosum* L. subsp. *romanicum* Borza and

Centaurea dacica Borza. (These descriptions were published originally in Bull. Inform. Mus. Bot. Univ. Cluj 1: 19–24. March 25, 1921.)—*John E. Dinsmore.*

1233. Borza, Al. **Schedae ad "Floram Romaniae exsiccatam" a Museo botanico Universitatis Clusiensis editam. Centuria IV. et V.** [Labels for dried plants, illustrating the flora of Rumania, edited by the Botanical Museum of the University of Cluj. Centuries IV and V.] Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj 4: 38–78. 1924.—The "schedae" comprise 1 Alga, 5 Fungi, 3 Lichens, 15 Bryophytes, 7 vascular Cryptogams, 4 Gymnosperms and 196 Angiosperms, with many critical remarks and some new localities. New for science are: *Agropyrum Brandzae* Panțu & Solacolu, *Cerastium arvense* L. subsp. *calcicolum* (Schur.) Borza var. *eglandulosum* Borza, *Dianthus capitatus* Balbis subsp. *moldavicus* Crinț., *Alyssum murale* W.K. f. *stellutatum* Borza, *Viola Péterfii* Nyár. (=V. hirta × Jóoi), *Anchusa procera* Bess. f. *glabrescens* Cușul.—*E. Pop.*

1234. Brainerd, Ezra. **Some natural violet hybrids of North America.** Vermont Agric. Exp. Station Bull. 239. *1–203. Pl. 1–82.* 1924.—A brief introduction by George P. Burns precedes the text. This publication includes descriptions and illustrations of 82 natural violet hybrids and represents some of the results obtained by the author during a period of over 20 years of intensive study of this group of plants. Descriptions have been previously published of most of the hybrids treated in the present work, but those which are indicated as new or for which no bibliographical reference is given are as follows: *Viola adunca* × *conspersa*, *V. affinis* × *emarginata*, *V. affinis* × *triloba*, *V. Brittoniana* × *triloba*, *V. conspersa* × *rostrata*, *V. cucullata* × *viarum*, *V. emarginata* × *Lovelliana*, *V. emarginata* × *sororia*, *V. emarginata* × *Stoneana*, *V. fimbriatula* × *latiuscula*, *V. Langloisii* × *rosacea*, *V. latiuscula* × *sororia*, *V. Lovelliana* × *papilionacea*, *V. missouriensis* × *sororia*, *V. nephrophylla* × *papilionacea*, *V. nephrophylla* × *sororia*, *V. primulifolia* × *vittata*, *V. rosacea* × *sagittata*, *V. rostrata* × *striata*, and *V. sagittata* × *sororia*.—*J. M. Greenman.*

1235. Chun, Woon Young. **Two new trees from Chekiang.** Jour. Arnold Arboretum 6: 144–145. 1925.—The 2 species described are *Torreya Jackii*, a species related to *T. californica* Torr., and *Halesia Margregorei* which adds another genus to the number of those genera considered formerly purely North American.—*Alfred Rehder.*

1236. Danser, B. H. **Rumex exsul, Nova Hibrida (R. Fennicus × nepalensis).** Nederland. Kruidk. Arch. 1924: 213–216. *1 fig.* 1925.—*Rumex exsul* n. hybr. (*R. fennicus* × *nepalensis*) is described as new to science.—*J. C. Th. Uphof.*

1237. Farwell, O. A. **Botanical gleanings in Michigan. II.** Amer. Midland Nat. 9: 259–282. 1925.—About 175 Michigan plants are treated systematically with especial emphasis on variations and localities. The following new forms, combinations, etc., are all given on the authority of Farwell. *Lacinaria spicata* (Linn.) OK. var. *foliacea* n. var., *Cardamine Douglassii* (Torr.) Britton f. *albidula* n.f., *Echinochloa Crus-galli* (Linn.) Beauv. var. *hispida* (Muhl.) n. comb. (*Panicum Crus-galli* var. *hispidum* (Muhl.) Ell. Bot., S.C. & Ga. I (1816) 114), *Echinochloa Crus-galli* var. *hispida* subvar. *laevigata* (Wiegand) n. comb. (*E. Walteri forma laevigata* Wiegand, Rhodora 23: 62. 1921), *Trillium erectum* L. var. *Cahnae* n. var., *Triorchis cernua* (L.) Nieuwl. var. *ochroleuca* (Rydb.) n. comb., *Hesperis matronalis* L. f. *albiflora* (DC.) n. comb. (*Hesperis matronalis* L. var. *albiflora* DC. Prodr. 1: 189. 1824), *Hirschfeldia Gallicum* (Willd.) n. comb. (*Sisymbrium Gallicum* Willd. Enum. Hort. Berol. (1809) 678.), *Uraspermum dulce* (Muhl.) n. comb. (*Scandix dulcis* Muhl. Cat. (1813) 31), *U. dulce* var. *laevicaule* n. var., *Volvulus spithamaeus* (Linn.) n.comb. (*Convolvulus spithamaeus* Linn. Sp. Pl. (1753) 158), *V. spithamaeus* var. *stans.* (Mx.) n. comb. (*Convolvulus stans* Mx. Fl. Bor. Am. 1: 136. 1803).—*J. P. Young.*

1238. Fleischmann, Hans. **Beitrag zur Orchideenflora der Insel Kreta.** [Contribution to the orchid-flora of the Island of Crete.] Oesterreich. Bot. Zeitsch. 74: 180–194. *Pl. 2.* 1925.—The material on which this study is based was collected in part by I. Dörfler and in part by C. Leonis. The following new species and variety are described: *Ophrys Heldreichii*, *O. omegaifera*, *O. Doerfleri*, *O. sphaciotica*, *O. fuciflora* Rb.f. var. *maxima*, and *Serapias Wettsteinii*.—*H. Cammerloher* (*translated*).

1239. [Fliaksberger, K. A.] Флаксбергер, К. А. **Aegilops triuncialis L. var. nigriaristata m. Труды по Прикл. Ботанике и Селекции** [Bull. Appl. Bot. and Plantbreed.]

13^1: 483–484. 1923.—A new variety with black awns has been established, *Aegilops triuncialis* L. var. *nigriaristata*. A Latin diagnosis is given under the Russian text.—*E. Sinskaja.*

1240. Grinţescu, I., et G. P. Antonescu. **Contribution à l'étude du méleze des Carpathes.** [**Contribution to the study of the Larix of the Carpathian Mountains.**] Bul. Soc. Ştiinte Cluj 2^2: 69–77. 1924.—The *Larix* species of the Ceahlău in the eastern Carpathian Mountains have been referred hitherto to *Larix sibirica* Led. A reexamination of material collected in 1923 proved that this critical *Larix* is neither *L. decidua*, nor *L. sibirica*, but *Larix polonica* Racib. The 3 species have arisen probably from a common ancestral *Palaeo-Larix* in the Tertiary epoch. *Larix polonica* occupied the Carpathian range in the Miocen, and was pressed back southward in the Glacial period. The present stations of this *Larix* represent relicts of an ancient geographic area.—*Al. Borza.*

1241. [Grossgeim, A. A.] Гроссгейм, А. А. **Новая раса дикой горной ржи, Secale Vavilovi m., из Закавказья.** [**A new variety of wild mountain rye in Transcaucasia.**] (English summary). Труды по Прикл. Бот. и Селекц [Bull. Appl. Bot. and Plantbreed.] 13^2: 461–482. 1923.—The new variety described, *Secale Vavilovi*, differs from the other varieties by being annual, while the others are perennial. A glaucous bloom, a short habit and small spikelets are its other characteristic features. Ecologically it is a psammophyte, which also distinguishes this variety among all others. It occurs at a height of 2000–2500 m. while the other varieties are mountain dwellers and grow at altitudes of not less than 5000 m. Owing to its morphological peculiarities, *S. Vavilovi* appears, as it were, a connecting link between *S. montanum* Guss. and *S. cereale.*—*E. Sinskaja.*

1242. Hermann, F. **Centaurea reditus nov. hybr. = C. calcitrapa L. × pseudophrygia C. A. M.** [**A new Centaurea hybrid.**] Repert. Spec. Nov. Regni Veg. **17**: 449. 1921. (Repert. Eur. et Med. **1**: 449. 1021).—A new hybrid, *Centaurea reditus*, from Bernburg, is described.—*John E. Dinsmore.*

1243. Hu, H. H. **Further notes on Chinese ligneous plants.** Jour. Arnold Arboretum **6**: 140–143. 1925.—This is a continuation of "Notes" published by the author in 1924 and contains the following new species and combinations: *Alnus Jackii*, *Meratia yunnanensis* (W. W. Sm.), *Deutzia Chunii*, *Itea longibracteata*, *Rubus Chungii*, *Fagara multijuga* (Franch.), *Xanthophyllum hainanense*, *Berchemiella crenulata* (Hand.-Mazz.), *Vitis fagifolia*, *V. chunganensis*, *Metaplexis sinensis* (Hemsl.), *Tabernaemontana pallida* (Pierre).—*Alfred Rehder.*

1244. Hutchinson, J. **Rhododendrons of Hupeh.** Gard. Chron. [London] Ser. III **75**: 340–341. 1924.—Certain conclusions in the article of same title by E. H. Wilson (Jour. Arnold Arboretum Vol. 2. No. 2) are criticised as being due to lack of authentic material; it is claimed that *Rhododendron pittosporaefolium* Hemsl., and *R. stamineum* Franch., are identical and that *R. praevernum* and *R. sutchuensis* are distinct. Reasons for such conclusions are given.—*P. L. Ricker.*

1245. [Kul'tiasov, M. V.] Культисов, М. В. **К. систематике рода Cousinia Cass.** [**The systematic position of the genus Cousinia Cass.**] Trans. Sci. Soc. Turkestan **1**: 109–114. *3 pl.* 1923.—Monographic study of characteristic groups of plants of the Turkestan flora proper is of importance in the solution of genetic problems of the botanical geography of Turkestan, and fundamental for the Oriental flora in general. One such group of great significance is *Cousinia*. There is a description of the new species.—*V. Lashevsky.*

1246. Lam, H. J. **The Sapotaceae, Sarcospermaceae and Boerlagellaceae of the Dutch East Indies and surrounding countries (Malay Peninsula and Philippine Islands).** Bull. Jard. Bot. Buitenzorg III. **7**: 1–289. 1925.—After some introductory remarks and a full description of the family Sapotaceae, the author gives a conspectus of the genera of the family of which 15 with 215 species occur in the area under consideration. An artificial key to the genera is included and there are also keys to the species of each genus. Under each genus and species the literature and synonymy is fully cited, a complete description is given and the specimens examined are enumerated. The 65 text illustrations are mostly those of new species. The 2 remaining families consist of only 1 and 2 genera, respectively, of which the one has 3 species, while the 2 genera of Boerlagellaceae are monotypic. The following species and varieties, combinations, and names are new: *Palaquium Gutta* f. *borneense* (Burck), f. *selendit* (Burck), f. *genuinum* with subf. *Gutta* and subf. *oblongifolium* (Burck), f. *Vrieseanum*

(Burck), *P. semaram*, *P. tjipetirense*, *P. decurrens*, *P. sericeum* and vars. *acutocalyx* and *obtusocalyx*, *P. Burckii*, *P. abundantiflorum*, *P. hispidum* and vars. *typicum* and *grandiflorum*, *P. sorsogonense* Elmer ms., *P. majas*, *P. confertum*, *P. eriocalyx*, *P. ferox*, *P. xanthochymum* vars. *glabrum* and *puberulum*, *P. globosum*, *P. hexandrum* vars. *psilandrum* and *eriandrum*, *P. rioense*, *P. stenophyllum*, *P. paucivenosum*, *P. ternatense*, *Isonandra borneensis*, *Burckella oxycarpa*, *B. Cocco* var. *Bawun* (Scheff.), *Ganua sessilis* (King & Gamble), *G. Motleyana* var. *rubropedicellata* (Burck), var. *latifolia* (Burck) and var. *glabrescens* (Miq.), *G. Curtisii* (King & Gamble), *G. Scortechinii* (King & Gamble), *G. pallida* (Burck), *Payena dantung*, *P. sericea* (Bl.), var. *typica* and var. *pulchra* (Burck), *P. Endertii*, *P. lancifolia*, *P. glabra*, *P. pseudoterminalis*, *Madhuca Kunstleri* (Brace), *M. lancifolia* (Burck), *M. Kingiana* (Brace), *M. hirtiflora* (Ridl.), *M. caudata* (Ridl.), *M. macrophylla* (Hassk.), *M. Dubardii*, *M. sericea* (Miq.), *M. penicillata* and *M. aristulata* (King & Gamble), *M. malaccensis* (Clarke), *M. penangiana* (King & Gamble), *M. Korthalsii* (Pierre), and var. *lanceolata* (King & Gamble), *M. Heynei*, *M. ovata*, *M. erythrophylla* (King & Gamble), *M. Burckiana* (Koord.), *M. cuneata* (Bl.), *M. aspera*, *M. rupicola* (King & Gamble), *M. laurifolia* (King & Gamble), *M. Beccarii* (Engl.), *M. cuprea* (King & Gamble), *M. longistyla* (King & Gamble), *M. tomentosa*, *M. Watsonii* (Ridl.), *M. stenophylla*, *M. crassipes* (Pierre), *M. sarawakensis* (Pierre), *M. glabrescens*, *M. costulata* (Pierre), *M. fulva* (Thwaites), *M. Moonii* (Thw.), *M. neriifolia* (Moon), *M. insignis* (Radlk.), *P. Pasquieri* (Dubard), *M. floribunda* (Dubard), *M. Thorelii* (Dubard), *M. cochinchinensis* (Dubard), *M. elliptica* (Dubard), *M. firma* (Dubard), *M. longifolia* (Koen.), *M. Pierrei* (Williams), *M. glaberrima*, *M. caloneura* (Kurz), *M. Lobbii* (Clarke), *Diploknema remiflora* (Merr.), *D. grandiflora* (Ridl.), *D. butyracea* (Roxb.), *Planchonella petaloides*, *P. keyensis* (Burck), *P. avenia* (Burck), *P. Kaernbachiana* (Engl.), *P. moluccana* (Burck), *P. firma* Dubard vars. *typica* and *microcarpa*, *P. obovoidea* (Burck), *P. mindanaensis* (Merr.), *P. obovata* (R. Br.), *P. velutina* (Elmer), *P. Beccariana* (Pierre), *P. littoralis* (Ridl.), *P. rugosa* (Wall.), *P. glabra* (Ridl.), *P. Forbesii* (S. Moore), *P. chartacea* (F. v. Muell.), *P. longepetiolata* (King & Prain), *P. puberula* (DC.), *P. xerocarpa* (F. v. Muell.), *P. rostrata* (Merr.), *P. samoensis* (Reinecke), *P. burmanica* (Coll. & Hemsl.), *P. Gamblei* (Clarke), *Lucuma Maclayana* (F. v. Muell.), *L. pomifera* (Pierre), *L. navicularis*, *L. dolichosperma*, *L. macrantha* (Merr.), *L. lucida* (Burck), *L. luzoniensis* (Merr.), *L. occidentalis*, *Mimusops Elengi* var. *typica*, var. *typica* f. *longepedunculata* (Bl.), var. *parvifolia* (R. Br.) and var. *brevifolia*, *Manilkara calophylloides* (Merr.), *M. emarginata*, and *Northia fasciculata* (Warb.). Two new families, Sarcospermaceae, based on *Sarcosperma* Hook. f., and Boerlagellaceae, based on *Boerlagella* Pierre, are proposed.—*Alfred Rehder.*

1247. McKelvey, Susan Delano. **Syringa rugulosa, a new species from western China.** Jour. Arnold Arboretum 6: 153–154. 1925.—*Syringa rugulosa*, a new species from Yunnan and closely related to *S. Potaninii* Schneid., is described.—*Alfred Rehder.*

1248. Merrill, E. D. **Additions to our knowledge of the flora of Hainan.** Jour. Arnold Arboretum 6: 129–140. 1925.—During recent years the hitherto little known flora of Hainan has been explored by W. Y. Chun and by F. A. McClure. The plants mentioned in this paper were mostly collected by W. Y. Chun. Nine genera are recorded here for the first time from China: *Dacrydium*, *Phyllochlamys*, *Popowia*, *Orophea*, *Drypetes*, *Calpigyne*, *Apodytes*, *Lithosanthes* and *Smythea*, and the following species and names are new: *Fissistigma hainanense*, *Orophea hainanensis*, *Evodia Chunii*, *Xanthophyllum racemosum* Chodat, *Drypetes hainanensis*, *Calpigyne hainanensis*, *Smythea nitida*, *Heritiera parvifolia*, *Eugenia multipunctata*, *Symplocos Chunii*, and *S. fasciculiflora.*—*Alfred Rehder.*

1249. Murbeck, Sv. **Contributions à la connaissance de la flore du Maroc II. Géraniacées—Composées. [Contributions to the knowledge of the flora of Maroc II. Geraniaceae—Compositae.]** Lunds Univ. Årsskrift N. F. Avd. 2. 19[1]: 1–68. *Pl. 1–7.* (Kungl. Fysiog. Sällsk. Handl. N. F. 34[1]: 1–68. *Pl. 1–7.* 1923.—The following new species, subspecies, and varieties are included: *Erodium cicutarium* L. subsp. *bicolor*, *Euphorbia falcata* L. var. *marocana*, *Rhamnus oleoides* L. subsp. *atlantica*, *Thymelaea salsa*, *Daucus crinitus* Desf. var. *comosus*, *Cynoglossum cheirifolium* L. var. *lasianthum*, *Echium Barrattei* A. de Coincy var. *brevicalyx*, *Nepeta Apulei* Ucria var. *maroccana*, *Verbascum maurum* Maire & Murb., *Celsia sinuata* Cav. var. *demnatensis* Maire & Murb., *Chaenorrhinum hians*, *C. rubrifolium* Rob. &

Cast. var. *imintalensis*, *Veronica hederifolia* L. subsp. *maura*, *Campanula Loeflingii* Brot. var. *maura*, *Anacyclus radiatus* Loisl. var. *coronatus*, and *Calendula Murbeckii* Lanza. In addition to these, amplified descriptions are given of many previously published but little known species, and critical notes are recorded.—*J. M. Greenman.*

1250. Muszyński, Jan. **Modligrozek właściwy (Abrus precatorius) i modligroszki rzekome.** [**True and false jequirity.**] Acta Soc. Bot. Poloniae **2**: 200–207. *Fig. 11.* 1924.

1251. Nakai, T. **Two new genera of Bambusaceae, with special remarks on the related genera growing in eastern Asia.** Jour. Arnold Arboretum **6**: 145–153. 1925.—The author describes 2 new genera, **Pleiodlastus** and **Indocalamus**, enumerates all the genera and species known from eastern Asia and gives an analytical conspectus of the 8 genera recognized. The following combinations are new: *Pleioblastus communis* (Mak.), *P. gramineus* (Bean), *P. Hindsii* (Munro), *P. linearis* (Hackel), *P. Matsunoi* (Mak.), *P. Maximowiczii* (Rivière) and var. *argenteo-striatus* (Mak.), *P. Simoni* (Carr.) and var. *variegatus* (Hook. f.) and var. *heterophyllus* (Mak.), *Indocalamus Fargesii* (E. G. Camus), *I. floribundus* (Thwaites), *I. niitakayamensis* (Hay.), *I. rigidulus* (E. G. Camus), *I. sinicus* (Hance), *I. Walkerianus* (Munro), *I. Wightianus* (Nees) and var. *hispidus* Steud., *Sasa stenantha* (Mak.), *Pseudosasa variegata* (Sieb.), *P. disticha* (Mitf.), *Semiarundinaria sat* (Balansa), *S. Pantlingii* (Gamble), *Chimonobambusa baviensis* (Balansa), *C. callosa* (Munro), *C. densifolia* (Munro), *C. falcata* (Nees), *C. Griffithiana* (Munro), *C. Hookeriana* (Munro), *C. intermedia* (Munro), *C. khasiana* (Munro), *C. polystachya* (Kurz), *C. pumila* (Chev. & Camus), *Sinobambusa elegans* (Kurz), *Oreiostachys ciliata* (Camus), and *Fargesia densiflora* (Rendle).—*Alfred Rehder.*

1252. Paczoski, Józef. **Cytisus Skrobiszewskii n. sp.** Acta Soc. Bot. Poloniae **2**: 64–65. 1924.—This new species was found by the author in the Kherson district of southern Russia. A full description in Latin is given.—*H. Czeczott* (*translated*).

1253. Panţu, Z. C. **Sur Silene pontica Brandza.** Bull. Section Sci. Acad. Roumain **9**: 32–38. *1 pl.* 1924.—Affinities of this littoral-plant from Dobrogea are established, accompanied by a detailed description.—*Al. Borza.*

1254. Pevalek, I. **O šafranu Crocus vittatus Schloss. et Vukot.** [**Crocus vittatus Schloss. & Vukot.**] Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] **34**[1]: 39–44. *2 fig.* 1922.—Wittasek showed that the diagnosis of the above mentioned species is incorrect in relation to the production of tubers. The author has examined the original specimen and found in the diagnosis yet a second error in the passage which relates to the pubescence in the throat. *Crocus vittatus* is interpreted therefore not as *C. Heuffelianus* (according to Wittasek) but as *C. neapolitanus.*—*Author* (*translated*).

1255. Pole Evans, I. B. (Editor). **Flowering plants of South Africa. Vol. III.** *Pl. 81–120.* 1923.—This volume contains illustrations and descriptions of the following plants: *Clematopsis Stanleyi* Hutch., *Mimetes hottentotica* Phillips & Hutch. n. sp., *Senecio Medley-Woodii* Hutch. n. sp., *Protea compacta* R. Br., *Gerbera plantaginea* Harv., *Aloe variegata* L., *Ceratotheca triloba* E. Mey., *Dicoma Zeyheri* Cass., *Hyobanche Fulleri* Phillips n. sp., *Romulea Austinii* Phillips n. sp., *Lachenalia Roodeae* Phillips n. sp., *Brunia Stokoei* Phillips, *Hoodia Bainii* Dyer, *Tritonia Mathewsiana* L. Bolus, *Leucospermum cordatum* Phillips, *Aloe saponaria* Haw., *Synnotia Metelerkampiae* L. Bolus, *Chrysophyllum magalismontanum* Sond., *Cyrtanthus helictus* Lehm., *Protea Stokoei* Phillips n. sp., *Greyia Radlkoferi* Szyszy., *Mesembryanthemum digitatum* Ait., *Brachycorythis pubescens* Harv., *Mackaya bella* Harv., *Adenium oleifolium* Stapf. var. *angustifolium* Phillips n. var., *Craterostigma plantagineum* Hochst., *Aloe comosa* Marloth, *Protea pityphylla* Phill. var. *latifolia* Phillips n. var., *Triaspis Nelsoni* Oliv., *Mesembryanthemum Pillansii* Kensit, *Aloe microcantha* Haw., *Erythrina Humeana* Spreng., *Adenia digitata* Engl., *Wachendorfia paniculata* Linn., *Crassula congesta* N.E. Br., *Gladiolus psittacinus* Hook., *Venidium macrocephalum* DC., *Lonchostoma monostylis* Sond., *Eulophia Zeyheri* Hook. f., and *Hessea Rehmanni* Baker.—*E. M. Doidge.*

1256. Pole Evans, I. B. (Editor). **Flowering plants of South Africa. Vol. IV.** *Pl. 121–160.* 1924.—This volume contains colored illustrations and descriptions of the following plants: *Stapelia flavopurpurea* Marloth, *Ansellia gigantea* Reichb. f., *Pachypodium Saundersii* N.E. Br., *Aloe verecunda* Pole Evans, *Gladiolus Ludwigii* var. *calvatus* Baker, *Veltheimia Roodeae* Phillips n.sp., *Strumaria truncata* Jacq., *Mimetes argentea* Knight, *Polyxena*

ensifolia Schönland, *Habenaria foliosa* Reichb. f., *Sutera grandiflora* Hiern., *Nerine Frithii* L. Bolus, *Protea Rouppelliae* Meisn., *Nerine lucida* Herb., *Eulophia leontoglossa* Reichb. f., *Haemanthus Katharinae* Baker, *Diplocyatha ciliata* N.E.Br., *Urginea Burkei* Baker, *Nerine flexuosa* Herb., *Ceropegia ampliata* E. Mey., *Richardia melanoleuca* Hook. f., *Urginea macrocentra* Baker, *Ceropegia Sandersoni* Decne., *Anoiganthus breviflorus* Baker, *Burchellia bubalina* Sims, *Pelargonium pulverulentum* Colv., *Thunbergia natalensis* Hook., *T. alata* Boj., *Aloe Peglerae* Schonl., *Pseudobaeckea virgata* Nied., *Aloe Schlechteri* Schonl., *Montbretia crocosmaeflora* Hort., *Oxalis lupinifolius* Jacq., *Cotyledon Wickensii* Schonl., *Aloe petricola* Pole Evans, *Crassula portulacea* Lam., *Euphorbia Cooperi* N.E.Br., *Lachenalia pendula* Ait., *Cyrtanthus Galpinii* Baker, and *Aloe chortolirioides* Berger.—*E. M. Doidge.*

1257. Prodan, I. **Contibuţiuni la Flora Siberiei. [Contributions to the flora of Siberia.]** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **5**: 42–45. 1925.—This paper contains the first part of an enumeration of plants collected in western Siberia, near Berezovca. New species by authority of Prodan are: *Aconitum Borzaeanum*, *Ranunculus Nyárádyanus*, *R. Szewaldianus*, *Cimicifuga foetida* L. f. *pilosa*, and *Arenaria capillaris Poir.* f. *sibirica.*—*Al. Borza.*

1258. Prodan, I. **Labiatae novae et rarae. [New and rare Labiatae.]** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **3**: 81–84. 1923.—Under *Phlomis tuberosa* L. the new varieties *Szeewaldii* (with 2 forms) and var. *Rozaliae* are described. The following are also described as new: *Leonurus cardiaca* L.f. *tenuilobus* and f. *integribracteata*, *L. villosus* var. *cannabifolius*, *Mentha longifolia* Huds. var. *Focşanensis*, *M. longifolia* Huds. var. *romanica* and *M. longifolia* Huds. var. *moldavica.* The genera *Leonurus* and *Mentha* are from Rumania. *Phlomis* is from Europe and Asia.—*Al. Borza.*

1259. Prodan, I. **Plante noi şi rari din Dobrogea nouă (Cadrilater). Neue und seltene Pflanzen aus Neudobrogea (Südostrumänien). [New and rare plants from New-Dobrogea (Southeastern Rumania).]** Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj **5**: 38–41. 1925. —Full descriptions and some critical notes are given of the following new plants from the eastern steppe-region: *Poa romanica*, *Agropyron Sarterianum* (Boiss. & Heldr.) Grec. f. *glabrum*, *Genista trifoliata* Janka var. *romanica*, *Stachys orientalis* Vahl. var. *turcica* and f. *late-bracteata*, *S. Heraclea* All. var. *umbria*, *S. ajugaefolia*, *S. sideritioides* L. var. *dobrogense*, and *Dianthus Borzaeanus.* Prodan is the authority.—*Al. Boraz.*

1260. Rehder, Alfred. **Amelasorbus, a new bigeneric hybrid.** Jour. Arnold Arboretum **6**: 154–156. 1925.—A hybrid between *Amelanchier florida* and *Sorbus sitchensis*, discovered in Idaho and cultivated in the Arnold Arboretum, is described as *Amelasorbus Jackii.*—*Author.*

1261. Schipper, W. W. **Beschrijving van Inheemse Intermediaire Rubus-Bastaarden. [Description of native intermediate Rubus hybrids.]** Nederland. Kruidk. Arch. **1924**: 148–186. 1925.—It is frequently claimed that descriptions and illustrations of *Rubus* hybrids are worthless. The writer states, however, that the characteristics can be well distinguished. When trained to it one may recognize at first sight a certain hybrid A number of hybrids and triple hybrids found in the Netherlands are extensively described.—*J. C. Th. Uphof.*

1262. Schustler, Fr. **Scrofulariae nodosae formae novae. [New forms of Scrofularia nodosa L.** Repert. Spec. Nov. Regni Veg. **17**: 455–456. 1921. (Repert. Eur. et Med. **1**: 455, 456. 1921.)—The following new varieties and forms from Bohemia and Moravia are described: *Scrophularia nodosa* L. var. *cordata* f. *genuina* and f. *montana; S. nodosa* L. var. *nemorosa* f. *gigantea*, f. *glabra*, f. *glandulosa*, and f. *flavescens; S. nodosa* L. var. *saxatilis;* and *S. nodosa* L. subsp. *chamaeneriifolia.*—*John E. Dinsmore.*

1263. Stent, Sydney M. **South African Gramineae. Grasses of the Transvaal as represented in the National Herbarium.** Bothalia **1**: 222–303. 1924.—A key is given to all the genera of the South African grasses. This is followed by descriptions of all the genera, and records of the species occurring in the Transvaal. The following new species are described in greater detail and illustrated: *Ischaemum Mellei*, *Sebima Galpinii*, *Hyparrhenia glauca*, *Eriochloa Fouchei*, *Digitaria Smutsii*, *D. setivalva*, *Sporobolus Smutsii*, *S. nitens*, and *Tristachya pallida.*—*E. M. Doidge.*

1264. Stevenson, J. B. **Rhododendron series.** Rhododendron Soc. Notes **2**: 215–227. 1925.—A tentative arrangement in 39 series of the known species of *Rhododendron*, except those from New Guinea and Malaysia, is given.—*Alfred Rehder.*

1265. Stojanov, Nikolai. **Neue Materialen zur Flora Bulgariens. [New material for the flora of Bulgaria.]** Oesterreich. Bot. Zeitsch. **74**: 202–303. 1925.—The work contains a number of new localities for known species, as well as the following new varieties and new combination: *Malabaila aurea* S.S. vars. *lejocarpa* and *lasiocarpa*, *Laserpitium garganicum* Ten. var. *balcanicum*, and *Peucedanum alsaticum* L. var. *Pichleri* (*P. Pichleri* Boiss.).—*H. Cammerloher* (*translated.*)

1266. Tagg, H. F. **Notes.** Rhododendron Soc. Notes **2**: 241–250. 1925.—This includes several notes, of which the 1st contains a numerical index of collectors' field-numbers of Burma-Chinese Rhododendrons of the *R. grande* series. The 2nd note contains brief remarks on some new species of *Rhododendron* to be fully described and in fact since published in the Notes of the Royal Botanic Garden Edinburgh. The 2 last notes deal with *Rhododendron calophytum* Franch. and with *R. Bodinieri.*—*Alfred Rehder.*

1267. Urban, Ign. **Plants from Beata Island, St. Domingo collected by C. H. Ostenfeld. (Botanical results of the Dana-Expedition 1921–22, No. 1.) Phanerogams.** Dansk Bot. Arkiv **4**[7]: 5–10. *Pl. 1–3.* 1924.—The author lists about 50 species of angiosperms from Beata Island, including the following which are new to science: *Galactia dictiophylla*, **Ulbrichia** n. gen. of the Malvaceae, *U. beatensis*, *Plumeria Ostenfeldii*, *P. beatensis*, and *Tabebuia Ostenfeldii.*—*J. M. Greenman.*

1268. [Utkin, L. A.] Уткин, Л. А. **Лекарственая Валерьяна (Valeriana officinalis L.) на Кавказе. [Medicinal Valeriana officinalis L. in the Caucusus.]** Записки научно-прикладных Отделов Тифлисского Ботанического Сада. [Sci. Papers Appl. Sect. Tiflis Bot. Garden] **3**: 35–65. 1922–1923.—A description is given of the various forms of *Valeriana officinalis* L. and attention is called to the medicinal value of the plant due to the presence of ethereal oils in its roots.—*L. J. Pessin.*

1269. Wein, Kurt. **Was ist Alyssum paniculatum Desf.? [What is Allyssum paniculatum Desf.?]** Oesterreich. Bot. Zeitsch. **74**: 198–201. 1925.—This species was proposed by Desfontaines for a specimen which was collected by Tournefort on his journey in the Orient (1700). Tournefort himself described it as "*Alysson Graecum frutescens, Serpilli folio amplissimo.*" Boissier maintained it to be a form of *A. creticum*, which view von Halácsy followed. Hayek finally placed it as a doubtful synonym of *A. creticum*. The original material is no longer extant. Pure historical investigation proves that it cannot be treated as *A. creticum*, but rather as *A. tenium*. A comparison of this species with the illustration of *A. paniculatum* of Desfontaines, which was portrayed by Aubriet from the original material, gives morphological evidence.—*H. Cammerloher* (*translated*).

1270. Wilson, Ernest H. **The Rhododendrons of eastern China, the Bonin and Liukiu Islands and of Formosa.** Jour. Arnold Arboretum **6**: 156–186. 1925.—The author gives first a general description of the area under consideration and a brief history of the discovery of the more important species and of their introduction into cultivation. This is followed by a systematic enumeration and description of 40 species; the species are divided into sections and at the beginning of each section there is a key to the species included. Of each species the synonyms are enumerated and a description is given followed by notes on the relationship, special characteristics, and the discovery and introduction into cultivation. The following species are new: *Rhododendron anwheiense*, *R. Dunnii*, and *R. Sasakii.*—*Alfred Rehder.*

1271. Wilson, Ernest H. **The Rhododendrons of the Bonin and Luikiu Islands and of Formosa.** Rhododendron Soc. Notes **2**: 228–240. 1925.—This article is an abstract of a preceding paper (see preceding Entry), with the keys, the full descriptions and synonyms omitted and restricted to the species of the Bonin and Luikiu Islands and Formosa.—*Alfred Rehder.*

1272. Wolff, H. **Prangos longiradia nov. spec. aus Kurdistan. [Prangos longiradia n. sp. from Kurdistan.]** Repert. Spec. Nov. Regni Veg. **17**: 456–458. 1921. (Repert. Eur. et Med. **1**: 456–458. 1921.)—Descriptions are given of the following new species and new combination: *Prangos longiradia*, *Bunium carviforme* C. Koch mss. from Pontus, Asia Minor, and *Pimpinella intermedia* (*Reutera intermedia* Stapf.) from Kurdistan.—*John E. Dinsmore.*

1273. Yamamoto, Yoshimatsu. **Supplementa Iconum Plantarum Formosanarum I. [Supplement to illustrations of plants of Formosa I.]** *ii + 47 p. 1 pl., fig. 1–20.* Government Res. Inst.: Taihoku, Formosa, 1925.—The present part is concerned with supplementary information on the Moraceae, Urticaceae, Aquifoliaceae, and Convolvulaceae. The following new species, varieties, and forms are included: *Ficus cuneatonervosa*, *Pilea brevicornuta* Hayata f. *laxiflora* and f. *magnifolia*, *P. cuneatifolia*, *P. distachys*, *P. Matsudai*, *P. minor*, *P. Miyakei*, *P. nokozanensis*, *Pellionia arisanensis* Hayata vars. *caudatifolia* and *pygmaea*, *P. chikushiensis*, *P. keitaoensis*, *P. scabra* Benth. var. *pedunculata*, *Memorialis Matsudai*, *M. neurocarpa*, *M. pentandra* Wedd. var. *akoensis*, *Ilex arisanensis*, *I. crenata* Thunb. var. *Kanehirai*, *I. hakkuensis*, *I. impressivena*, *I. koshunensis*, *I. Matsudai*, *I. Morii*, *I. Sasakii*, *Evolvulus alsinoides* L. f. *rotundifolia* (Hayat.), and *Ipomoea tomentosa*.—*J. M. Greenman.*

1274. [Zhukovskii, P. M.] Жуковский, П. М. **Дикая двузернянка в Грузии. [Triticum dicoccum Schrank dicoccoides Körn. in Georgia.]** Записки Научно-прикладных Отделов Тифлисского Ботанического Сада. [Sci. Papers Appl. Sect. Tiflis Bot. Garden.] 3: 1–4. *1 fig.* 1924.—The author describes *Triticum dicoccum* Schrank var. *Timopheevi* as a new variety from Georgia, Transcaucasia; it is said to be a variety of the group *T. dicoccum dicoccoides* Körn.—*L. J. Pessin.*

1275. [Zhukovskii, P. M.] Жуковский, П. М. **Дикаякультурная однозернянка в Грзии. [Wild and cultivated Triticum monococcum aegilopoides Aschers. et Gräbn. et T. monococcum cereale Aschers et Gräbn. in Georgia.]** Записки Научно-прикладных Отделов тифлисского Ботанического Сада [Sci. Papers Appl. Sect. Tiflis Bot. Gard.] 3: 4–7. *1 fig.* 1924.—A new variety, *Triticum monococcum* L. var. *Mayssuriani*, is described by the author. He also characterizes a 2nd variety as *T. monococcum* L. var. *Eredvianum*. Both are from Georgia in Transcausacia.—*L. J. Pessin.*

REVISIONS AND MONOGRAPHS

1276. Hoehne, F. C., & J. G. Kuhlmann. **Utriculárias do Rio de Janeiro e seus arredores. [Utricularias of Rio de Janeiro and vicinity.]** Mem. Inst. Butantan 1: 5–26. *Pl. 1–8.* 1918. —The authors record 17 species of *Utricularia* as occurring in Rio de Janeiro and vicinity. Each species is redescribed in detail and the descriptions are supplemented by illustrations. A key to the species is also given.—*J. M. Greenman.*

1277. Jones, Marcus E. **Revision of North American species of Astragulus.** *8vo. 330 p. 78 pl.* Published by the author: Salt Lake City, Utah, 1923.—A brief historical account of *Astragalus* is presented with particular reference to previous taxonomic treatments of the group. The present revision recognizes 273 species and numerous varieties as occurring in North America. These are assembled in 31 groups, and a diagram is added showing the probable phylogenetic relationships. An artificial key to the groups is given, and keys to the species under each group are also provided. The following new species, varieties and combinations are included: *Astragalus Coltoni* Jones var. *aphyllus*, *A. campestris* (Nutt.) Gray var. *decumbens* (*Homalabus decumbens* Nutt.), *A. campestris* var. *hylophilus* (*H. hylophilus* Rydb.), *A. campestris* var. *crispatus*, A. *junceus* (Nutt.) Gray var. *attenuatus*, *A. Woodruffi*, *A. yukonis*, *A. scalaris* Wats. var. *quercetinus*, *A. nutans*, *A. pictus* Gray var. *magnus*, *A. capillipes*, *A. leucopsis* Torr. & Gray var. *lonchus*, *A. lentiginosus* Dougl. vars. *albifolius*, *sierrae*, *scorpionis*, and *carinatus*, *A. Gormani* Wight, *A. aboriginum* Rich. var. *fastigiorum*, *A. Cottoni*, *A. rafaelensis*, *A. tetrapterus* Gray var. *Capricornus*, *A. arrectus* Gray var. *remotus*, *A. cimae*, *A. Lyallii* Gray var. *caricinus*, *A. atratus* Wats. var. *owyheensis* (*A. owyheensis* Nelson), *A. Painteri*, *A. guatemalensis* Hemsl. vars. *oaxacanus* and *Lozani*, *A. Rosei*, *A. Diehlii*, *A. gracilentus* Gray var. *exsertus*, *A. desperatus* Jones var. *petrophilus*, *A. argophyllus* Nutt. vars. *Martini* and *cnicensis*, *A. remulcus* Jones var. *chloridae*, *A. amphioxys* Gray var. *cymbellus*, *A. Purshii* Dougl. var. *interior*, *A. orizabae* Seaton var. *irolanus*, *A. Osterhouti*, *A. coahuilae*, *A. tener* Gray vars. *Brucae* and *rattanoides*, *A. madrensis*, *A. luisanus*, *A. Schaffneri*, *A. esperanzae*, *A. chapalanus*, *A. militaris*, *A. saltonis*, *A. Seatoni* Jones var. *crucis*, *A. Goldmani*, and *A. angelinus*.—*J. M. Greenman.*

1278. Phillips, E. P. **Species of Elephantorrhiza in the South African Herbaria.** Bothalia 1: 187–193. *Pl. 5–6.* 1922.—The genus *Elephantorrhiza* is a small genus comprising 7

South African species. *E. Burchellii* Bth. is an acaulescent plant with enormous roots, which have been used for tanning. The 7 species and 2 varieties are described, including 2 new species, namely, *E. pubescens* and *E. Woodii*.—*E. M. Doidge.*

1279. Trelease, William. **The American oaks.** Mem. Nat. Acad. Sci. [Washington, D. C.] 20: 1–255. *Pl. 1–420* + 1. 1924.—Following a brief introduction, the author gives short paragraphs under each of the following captions: Historical, the study of types, concept of species, habit, bark, wood, twigs, buds, stipules, vernation, leaf, inflorescence, flowers, fruit, teratology, galls, and hybridity. A list of American hybrids is given, and 51 of these are admitted for the U. S. A. The body of the work is presented under the following main headings: Taxonomy, geographic distribution, geologic history, evolution, descriptive treatment, revision, references, explanation of plates, indexes, and illustrations. Under the heading of geologic history appears a list of the species reported as fossil in America, together with their locality and the formation in which they have been found. The author admits 371 species for the entire existing American flora, and over 50% of these are now figured for the first time. The primary subdivisions of the genus are indicated, namely, *Leucobalanus* or white oaks, *Protobalanus* or intermediate oaks, and *Erythrobalanus* or red oaks. The following new species, names, and combinations are included: *Quercus comasaguana, Q. Pilarius, Q. Reevesii, Q. pinalensis* (*Q. cuneifolia* Liebm., not Raf.), *Q. toxicodendrifolia, Q. boqueronae, Q. Radlkoferiana, Q. porphyrogenita, Q. substenocarpa, Q. baldoquinae, Q. Harmsiana, Q. mixtecana, Q. conjungen, Q. cancellata, Q. subspathulata, Q. crenatifolia, Q. aurantiaca, Q. matagalpana, Q. vicentensis, Q. arachnoidea, Q. Rekonis, Q. Martensiana, Q. prinopsis, Q. chartacea, Q. centralis, Q. panduriformis, Q. purulhana, Q. Poculifer, Q. haematophlebia, Q. Liebmannii* Oersted, *Q. Barbeyana, Q. pilicaulis, Q. barbanthera, Q. obscura, Q. transmontana, Q. vellifera, Q. durangensis, Q. diversicolor, Q. rhodophlebia, Q. ariaefolia, Q. Uhdeana, Q alvarazensis, Q. Purpusi, Q. conglomerata, Q. innuncupata, Q. Greggii* (*Q. reticulata* var. *Greggii* DC.), *Q. aculcingensis, Q. revoluta, Q. Loeseneri, Q. deserticola, Q. alveolata, Q. manzanillana, Q. Lecomteana, Q. vallicola, Q. texcocana, Q. subtriloba, Q. Frutex, Q. alpescens, Q. potosina, Q. cordifolia, Q. intricata, Q. chihuahuensis, Q. jaliscensis, Q. jaralensis, Q. undata, Q. infralutea, Q. invaginata, Q. Praeco, Q. convallata, Q. pallescens, Q. Sacame, Q. bipedalis, Q. depressipes, Q. perpallida, Q. opaca, Q. sebifera, Q. Schenckiana, Q. ceripes, Q. striatula, Q. subturbinella, Q. Hartmani, Q. sillae, Q. Eduardi* (*Q. oligodonta* v. Seemen, not Saporta), *Q. nitidissima, Q. Duraznillo, Q. balsequillana, Q. viminea, Q. bolanyosensis, Q. peninsularis, Q. epileuca, Q. campanariensis, Q. incarnata, Q. felipensis, Q. moreliana, Q. errans, Q. chicamolensis* (*Q. mollis* Mart. & Gal., not Raf.), *Q. Hahnii, Q. esperanzae, Q. orbiculata, Q. miguelitensis, Q. tepicana, Q. pennivenia, Q. aerea, Q. Jonesi, Q. coccolobaefolia, Q. planipocula, Q. Rosei, Q. coffeaecolor, Q. aequivenulosa, Q. Praineana, Q. Langlassei, Q. chiquihuitillonis, Q. productipes, Q. exaristata, Q. hondurensis, Q. Endlichiana, Q. amphioxys, Q. uruapanensis* (*Q. nitida* Mart. & Gal., not Raf.), *Q. trinitatis, Q. Endresi, Q. crispifolia, Q. incrassata, Q. botryocarpa, Q. synthetica, Q. apanecana, Q. gemmata, Q. correpta, Q. acapulcensis, Q. tahuasalana, Q. borucasana* (*Q. granulata* Liebm., not Raf.), *Q. Donnell-Smithii, Q. flagellifera, Q. acatenangensis, Q. caeruleocarpa, Q. zempoaltepecana, Q. cuajimalpana, Q. major, Q. Bourgaei* Oersted, *Q. subavenia, Q. hypoxantha, Q. Scherzeri, Q. Wesmaeli, Q. consociata, Q. imbricariaefolia, Q. colimae, Q. malifolia, Q. obovalifolia* Fournier, *Q. axillaris, Q. subcrispata, Q. circummontana, Q. Fournieri, Q. serrulata, Q. alamosensis, Q. Rossii, Q. tepoxuchilensis, Q. similima, Q. impressa, Q. Seleri, Q. roseovenulosa, Q. Sipuraca, Q. acherdophylla, Q. saltillensis, Q. carnerosana, Q. cerifera, Q. crispipilis, Q. cinnamomea, Q. huitamalcana* (*Q. Serra* Liebm., not Unger), *Q. Brenesii, Q. Canbyi, Q. Karwinskii, Q. tonaguiae, Q. vexans, Q. Candolleana,* and *Q. albocincta.* In addition to these, numerous varieties and forms are characterized.—*J. M. Greenman.*

FLORISTICS AND PLANT DISTRIBUTION

1280. Bennett, Arthur. **Notes on Caithness plants.** Trans. & Proc. Bot. Soc. Edinburgh 29: 54–56. 1924.—These notes comprise the additions and new localities for species that have come to the notice of the author since the last publication in Trans. & Proc. Soc.

Edinburgh **27**: 309. This brings the total number of Caithness species up to 726.—*Thomas Swarbrick.*

1281. Bennett, Arthur. **Notes on Potamogeton.** Trans. & Proc. Bot. Soc. Edinburgh **29**: 45–53. 1924.—Some additions to the list of Potamogetons are given on the authority of the late Dr. Hagström. British species and hybrids: *P. natans* × *polygonifolius* = *P. gessnacensis* Fisch. var *Richtsfeldii* Fisch. f. *hibernicus* Hagst. This is *P. natans* Linn. var *linearis* Syme., and was collected between the Upper and Middle Lakes, Killarney. *P. alpinus* × *polygonifolius* = × *P. spathulatus* Schrad., and was found in 1907 in Jersey; it occurs also in Sweden, Hanover, and Alsatia. *P. alpinus* × *heterophyllus* = *P. nericius* (Hagst)., described and recorded from Sweden and Iceland, is now reported from the River Don at Aberdeen. *P. heterophyllus* × *polygonifolius* = × *P. Seemenii* Asch. & Graeb. is recorded as occurring in the River Laune below Killarney. *P. alpinus* Balb. is recorded from peaty drains in N. Lancashire. The color of these plants is peculiar and it would be valuable if a chemical analysis of their floating leaves could be made for, although at times they are a full green, usually on drying the red color appears, but on being placed again in water it disappears. *P. zosterifolius* Schum. The American specimens of this species show marked differences from British ones. *P. coloratus* × *pusillus* = *P. perpygmaeus* Hagst. Minute descriptions of some of these Potamogetons are given as well as their habitats and places where good dried specimens may be seen for comparison. An alien species to Britain, *P. foliosus* Raf., is also described and several foreign species are described in detail.—*Thomas Swarbrick.*

1282. Bošnjak, K. **Floristički izlet na Vranjicu planinu u Bosni.** [**A floristic excursion to the Vranica-plain in Bosnia.**] Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] **32**[2]: 35–54. 1920.—The author has worked up the material which he collected on his 2 excursions in the above mentioned region. He reports first on the previous investigations of this region, and gives also a general picture of the vegetation. There follows further a systematic enumeration in which about 200 phanerogams are noted, some of which were not previously known from the region.—*I. Pevalek* (*translated*).

1283. Dahlstedt, H. **De svenska arterna av släktet Taraxacum. I. Erythrosperma. II. Obliqua.** [**The related species of Taraxacum in Sweden, I. Erythrosperma. II. Obliqua.**] Acta Florae Sueciae [Utgivare] **1**: 1–160. *25 fig.* 1921.—Here 26 species are described, only *T. isthmicola* occurs in Finland, *T. lactiforme* and *T. simile* in Denmark along with *T. brachyglossum.*—(*Rev. in Bot. Notiser 1921: 147–148, translated by A. L. Bakke.*)

1284. Dolisy, A. **Les Rubus de la Florule de Torgny.** Bull. Soc. Roy. Bot. Belgique **57**[2]: 156–157. 1925.—Twenty-three species of *Rubus* are listed.—*E. De Wildeman.*

1285. Druce, G. Claridge. **Carex microglochin Wahl., a species new to Scotland.** Trans. & Proc. Bot. Soc. Edinburgh **29**: 1–3. 1924.—This small sedge which has never been previously recorded in Britain was discovered in Glen Lyon, Scotland, in July 1923 by Lady Davy and Miss Gertrude Bacon. It was found on bare flat places, avoiding the steep grassy slopes and places where water was trickling down the side, at altitudes from 2500 to 3000 feet. A description of *Carex microglochin* is given as well as a list of plants found growing along with it.—*Thomas Swarbrick.*

1286. Druce, G. Claridge. **Scottish Taraxaca.** Trans. & Proc. Bot. Soc. Edinburgh **29**: 4–7. 1924.—Recent work has led to the establishment of nearly 140 species of British hawkweeds which do not hybridise, and the characters of which remain constant under cultivation. It is probable that most if not all of these micro-species are apogamous. The dandelions are also said to be apogamous but this has yet to be verified. The author has gathered some 50 microspecies of dandelion in Britian and a short descriptive account is given of those occurring in Scotland. They are arranged in accord with Dahlstedt's treatment in 6 groups, as follows: (1) *Erythrosperma*, (2) *Obligua*, (3) *Ceratophora* (not yet recorded as British), (4) *Palustria*, (5) *Spectabilia*, and (6) *Vulgaria.*—*Thomas Swarbrick.*

1287. Frisendahl, A. **Myricaria germanica (L.) Desv. och dess utbredning i Skandinavien.** [**Myricaria germanica (L.) Desv. and its distribution in Scandinavia.**] Acta Florae Sueciae [Utgivare] **1**: 265–301. *Pl. 17, 28 fig.* 1921.

1288. Frisendahl, A. **Om Ranunculus Cymbalaria Pursh och fynd af densamma i Sverige.** [**Ranunculus Cymbalaria Pursh and its discovery in Sweden.**] Acta Florae Sueciae [Utgivare] **1**: 305–328. *28 fig.* 1921.

1289. Gjurašin, S. **Prilog hrvatskoj flori.** [**A contribution to the flora of Croatia.**] Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] 32²: 71–85. 1920.—The author enumerates 500 vascular plants of Croatia, most of which were collected in Velebit. Many new localities are recorded, and several species are new to the flora of Croatia.—*I. Pevalek* (*translated*).

1290. Gjurašin, S. **Dodatek flori zagrebačke okolice.** [**A contribution to the knowledge of the flora of the region of Zagreb.**] Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] 35: 138–141. 1924.—Two ferns and 20 phanerogams are recorded from the region of Zagreb. Some of these plants are new for the region, others are reported from new localities.—*I. Pevelek* (*translated*).

1291. Grinţescu, G. P. **Contribuţiuni la Flora României după plantele conţinute în "Herbarul Gh. P. Grinţescu."** [**Contributions to the flora of Rumania, based on the "Herbarium Gh. P. Grinţescu."**] Bul. Stiinţe Nat. 26⁶: 111–128. 1923. (Publicaţiile Societătii Naturaliştilor din România No. 6.)—An enumeration is given of 79 species Coniferae and Monocotyledoneae found in diverse regions of the country, with some interesting new species and varieties for Rumania.—*Al. Borza.*

1292. Groff, G. W., Edward Ding, and Elizabeth H. Groff. **An enumeration of the McClure collection of Hainan plants.** (To be continued.) Lingnaam Agric. Rev. 1²: 27–86. 1923 (See Bot. Absts. 13, Entry 5584); 2¹: 9–44. 1924; 2²: 115–139. 1925.

1293. Gussić, N. **Nova nalazišta Primulae auriculae L. u Hrvatskoj.** [**New habitat for Primula auricula in Croatia.**] Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] 30: 157. 1918.—The author reports the discovery of *Primula auricula* var. *Obristii* Beck in the vicinity of Zagreb and in the Strahinščica.—*I. Pevalek* (*translated*).

1294. Hirc, D. **Novi prilozi hrvatskoj flori III. Bijele Stijene.** [**New contributions to the flora of Croatia III. Bijele Stijene.**] Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] 30: 136–142. 1918.—Hirc reports on floristic collections made by him on an excursion, July 28th, 1899, to this mountain in southern Croatia, and records about 50 phanerogams.—*I. Pevalek* (*translated*).

1295. Holm, Theodore. **The vegetation of the alpine region of the Rocky Mountains of Colorada.** Mem. Nat. Acad. Sci. [Washington, D. C.] 19: 1–45. *Pl. 1–7.* 1923.—The author has made a study of the alpine flora of Colorado, namely, that region including Torreys Peak, Grays Peak, Mount Kelso, James Peak near Central City, Longs Peak near Estes Park, Mount Massive and Mount Elbert near Leadville, and Pikes Peak, at altitudes between 3350 and 4300 meters above sea level. One hundred and seventy species of vascular plants are listed for this region. Of these 170 species, 63 occur also in the Arctic region, and 31 of these are even circumpolar. The author concludes "that most, if not all, of the circumpolar species originated in the Arctic region. The other Arctic-Alpine species may have originated in the mountains farther south, some on this continent, some others in Europe or Asia, while some certain of these may have become developed and distributed from several centers, very remote."—*J. M. Greenman.*

1296. Hultén, Eric. **A list of plants from the Chukch-Peninsula.** Svensk Bot. Tidskr. 19: 104–110. 1925.—A list is given of plants in a collection sent to the author from Kamtchatka. In addition, a list of botanic literature referring to Arctic Asia is given.—*O. Heilborn.*

1297. Jansen, P., en W. H. Wachter. **Floristische aanteekeningen XXI. Festuca II.** [**Floristic notes XXI. Festuca II.**] Nederland. Kruidk. Arch. 1924: 203–212. 1925.—A critical study is presented of different forms and hybrids of *Festuca pratensis* Huds., *F. arundinacea* Schreb., and *F. gigantea* Vill., occurring in the Netherlands.—*J. C. Th. Uphof.*

1298. Johnson, H. H. **Additions to the flora of Orkney as recorded in Watson's "Topographical Botony."** Trans. & Proc. Bot. Soc. Edinburgh 29: 83–95. 1924.—This paper is a continuation of previous publications on the same subject and contains several corrections to former work and a further list of 19 species, varieties, forms, and hybrids recorded from Orkney in 1922–1923. Of these, 17 are native and 2 are mere casuals introduced through the agency of cultivation.—*Thomas Swarbrick.*

1299. Lundequist, O. F. E. **Bidrag till kännedomen om Grennatraktens flora.** [**Flora of the neighbourhood of Grenna (town in southern Sweden).**] Svensk Bot. Tidskr. 19: 116–118. 1925.—A list of localities is given.—*O. Heilborn.*

1300. Noelli, Alberto. **La presenza della "Plantago virginica L." e della "Plantago patagonica Jacq." in Italia.** [The occurrence of Plantago virginica L. and Plantago patagonica Jacq. in Italy.] Bull. Soc. Bot. Italiana 1924[6]: 131–132. 1924.—Near Stupinigi along the streamlet Sangone in a wood which had been cut down and replanted with *Populus canadensis*, different samples of *Plantago virginica* L. were collected on April 30th, 1924. These originated from North America (Canada, Carolina) and until now have probably not been collected in Europe. Later, in June, at the same place, another *Plantago* was collected, namely, *P. patagonica* Jacq., vigorous specimens having flower-stems with remarkably large leaves which were weak hairy on the upper surface. The presence of these species must be due probably to the material in which the samples of *Populus canadensis*, destined for transplanting in that place, had been packed. During the year the author returned to the same place, but due to the extraordinarily dry season he did not find any *P. virginica*, and only a few samples of *P. patagonica* which probably is more resistant.—*Author* (*translated by R. V. La Garde*).

1301. Nowinski, Marjan. **Zapiski florystyczne z południowo-wschsdniego kvańca kotliny Sandomierskiej.** [Floristic notices from the south-eastern part of basin of Sandomiezz.] Acta Soc. Bot. Poloniae 2[1]: 9–15. 1924.—The author enumerates a series of stations for plants which are more or less rare in the districts of Przeworsk, Jaroslaw and Lancut.—*H. Czeczott.*

1302. Nyárády, E. I. **Adnotaţiunii la Flora României. I.** [Additions to the flora of Rumania. I.] Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj 4: 95–98. 1924.—*Saxifraga hirculus* has been discovered in the eastern Carpathian Mountains in the Haghita Range. *Carex nitida* must be reinstated in the Transylvanian Flora, rectifying the opinion of Simonkai. —*Al. Borza.*

1303. Nyárády, E. I. **Centaurea ruthenica nu a dispărut din flora Transilvaniei.** [Centaurea ruthenica represented in the Transylvanian flora.] (Rumanian with German résumé.) Bul. Inform. Grădinii Bot. Muz. Bot. Univ. Cluj 3: 85–87. *1 fig.* 1923.—This very fine and decorative Pontic element of the Rumanian flora was discovered near Cluj.—*Al. Borza.*

1304. Polgár, S. **Az Amarantus blitoides S. Watson magyarországi elöfordulásáról.** [The occurrence of Amarantus blitoides S. Watson in Hungary.] Magyar Bot. Lapok 23: 120–121. 1924.—The author discovered this introduced plant in the following places: Györ, Tata, Tóváros, and Budapest.—*I. Györffy* (*translated*).

1305. Rossi, Lj. **Florula školjeva duž hrvatsks obale.** [The flora of the islands along the Croatian coast.] Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] 35: 78–86. 1923. —About 200 phanerogams are noted from the islands along the Croatian coast. These are distributed, as follows: 162 from the Island Sv. Marko, near Kraljevica; 30 from Sv. Martin, near Novi; 12 from Sv. Juraj near Sv. Juraj; and 1 from Zec.—*I. Pevalek* (*translated*).

1306. Samuelsson, G. **Carex dioeca-gruppen i den nordiska floran.** [Carex dioeca in the flora of the north.] Acta Flora Sueciae [Utgivare] 1: 217–244. *Pl. 15.* 1921—*Carex parallela* is considered as a well marked species. The best marked difference between it and *C. dioeca* is the rather doubtful distinction in the wall of the fruit, in that the former at maturity is pointed obliquely upward. It is small, oval-shaped, with a rather smooth appendage, while in *C. dioeca* the appendage is short, broadly oval and rough. *C. dioeca* var. *paralleloides* Lund and *C. subparallela* Norm. are forms of *C. dioeca.* A representative of this group is a hybrid between *C. dioeca* and *C. parallela.* Observations based only on herbarium material are hardly sufficient. In all probability the hybrid occurs in Sweden, Norway and Finland. —(*Rev. in Bot. Notiser 1921: 147–148, translated by A. L. Bakke.*)

1307. Săvulescu, Tr. **Neue Pflanzen aus Rumänien.** [New plants from Rumania.] Bull. Section. Sci. Acad. Roumain 9: 20–21. 1924.—*Bromus scoparius* L. and *Hypecoum ponticum* Vel. are mentioned from the District of Caliacra.—*Al. Borza.*

1308. Skarman, J. A. O. **Viola silvestris Rchb. på Kinnekulle.** [Viola silvestris Rchb. on Kinnekulle (mountain in the province Västergötland, Sweden).] Svensk Bot. Tidskr. 19: 114–115. 1925.—The species is reported from several places on this mountain.—*O. Heilborn.*

1309. Slooten, D. F. van. **Contributions à l'étude de la flore des Indes Néerlandaises.** [Contributions to a study of the flora of the Dutch East Indies. III. The Stylidiaceae of the

Dutch East Indies.] Bull. Jard. Bot. Buitenzorg III. 6: 65–67. 1924.—*Stylidium tenellum* Swartz, and *S. alsinoides* R. Br. are recorded from the area indicated, and descriptive notes are given.—*J. P. Young.*

1310. Soest, J. L. van. **Flora van Arnhem III. [Flora of Arnhem III.]** Nederland. Kruidk. Arch. 1924: 91–133. 1925.—A list is given of species and different forms of Violaceae to Papilionaceae found in the environs of Arnhem, Netherlands. The writer gives a division into districts in which the flora of the Netherlands may be grouped. That of Arnhem belongs to the fluviatilous, "subcentreuroop" and "Geldersch" districts.—*J. C. Th. Uphof.*

1311. Sterner, R. **Carex ligerica J. Gay. En floristik och växtgeografisk studie.[Carex ligerica J. Gay. A floristic and geographical study.]** Acta Flora Sueciae [Utgivare] 1: 185–216. *Pl. 14, 1 fig.* 1921.—Development of the species and reasons for separating it from closely allied species are given. *C. praecox* Schreb. in Sweden is with certainty closely related.—(*Rev. in Bot. Notiser 1921: 147–148, translated by A. L. Bakke.*)

1312. Trotter, A. **Di alcune Graminacee nuove o critiche della flora Libica. [Some new or critical Gramineae of the Libyan flora.]** Bull. Soc. Bot. Italiana 1925[2]: 58–60. 1925. —The author enumerates *Danthonia Forskalii* (Vahl) Trin., *Erianthus Ravennae* (L.) P.B., and *Panicum turgidum* Forsk., plants which have been collected in northern Tripoli and which are either entirely new to the flora of Libya or which signify a migration from the southern Colony (Fezzan). Bibliographical information and notes on distribution are recorded.—*Author (translated by R. V. La Garde).*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Sam F. Trelease, *Editor*

1313. Anonymous. **New uses for rubber milk.** Sci. Amer. 131: 108. 1924.

1314. Belling, John. **Compensating the unemployed eye in monocular instruments.** Science 62: 54–55. 1925.

1315. Dufour, M. **Sur les avantages des lampes de grand éclat. [The advantages of lights of high brilliancy.]** Compt. Rend. Soc. Biol. 91: 1331–1332. 1924.—By brilliancy is meant the candle power per unit of radiating surface. Three advantages of such lights in scientific work are pointed out: (1) The size of the penumbra increases with the size of the radiating surface, and a small surface enables one to distinguish details which otherwise would be drowned in the penumbra. (2) In certain cases, as when using an opthalmoscope, the source of light must be bright and as small as possible. (3) In projecting apparatus a clear field is not obtained if the illuminating source is not concentrated.—To procure all these advantages a new light is described consisting of 2 small tungsten spheres with a small arc between them. Direct current is used, and the lamp has all the advantages of the old arc light without the disadvantages.—*Oran Raber.*

1316. Farr, Clifford H. **The politeness of American botanists.** Science 62: 158–159. 1925.

1317. Galloway, B. T. **How to collect, label, and pack living plant material for long-distance shipment.** U. S. Dept. Agric. Dept. Circ. 323. *1–11. Pl. 1–10.* 1924.—This article contains suggestions, directions, and words of caution.—*L. R. Hesler.*

1318. Hausman, L. A. **The basis of aquatic life.** Sci. Amer. 131: 403–404. *12 fig.* 1924.

1319. Howe, Harrison E. **The trend and purpose of modern research.** Jour. Franklin Inst. 199: 187–202. 1925.—A discussion is given of the practical applications of research in the various fields of science.—*Ernest S. Reynolds.*

1320. Kempton, J. H. **The politeness of American botanists.** Science 62: 158. 1925.

1321. Little, Arthur D. **The Fifth Estate.** Jour. Franklin Inst. 198: 599–614. 1924. —This article contains a survey of the contributions of science to civilization and a warning of the dangers to society if the teachings of science are not heeded.—*Ernest S. Reynolds.*

1322. Lodian, L. **What the other half eats.** Sci. Amer. 131: 166–167. *8 fig.* 1924.—This is an illustrated article briefly describing some interesting plant and animal food stuffs to be found in the foreign food stores of a big American city.—*Chas. H. Otis.*